



## A WONDERFUL MEDICINAL PLANT: *SECURINEGA LEUCOPYRUS* (WILLD) MUELL- A BRIEF REVIEW

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### ABSTRACT

The objective of this paper is to review the literature regarding *Securinega leucopyrus*, (Willd) Muell., which is described by the medico-ethno botanist as a wonderful drug for the treatment of wound healing. Specifically the literature was reviewed for articles pertaining to chemical properties and therapeutic benefits. This review is in a narrative format and consists of all publications relevant to *S. leucopyrus* that were identified by the authors through a systematic search of major computerized medical databases; no statistical pooling of results or evaluation of the quality of the studies was performed due to the widely different methods employed by each study. Studies indicate that *S. leucopyrus* possesses anti-inflammatory, anti-arthritic and anti-oxidant and wound healing properties. The mechanisms of action for these properties are not fully understood. The extract of leaves and stem bark at different concentrations is highly effective against all organisms such as Gram positive, Gram negative and single fungal strain. Exhaustive research regarding isolation of more phytochemicals and pharmacology study on this medicinal plant is still necessary so as to explore the plant regarding its medicinal importance. Therefore, the aim of this review is to boost up present day researchers in this direction to undertake further investigation of this plant. The present review covers floras, websites, databases, journals and classical texts.

**Key Words:** *Securinega leucopyrus*, *Katupila*, Euphorbiaceae, Anti-oxidant, DPPH,

## INTRODUCTION

Medicinal plants are an important resource to traditional health care systems. It is estimated that 70-80% of the rural population in developing Asian nations depends on traditional medicine for primary healthcare today. According to the World Health Organization (WHO), more than 80% of the World's population relies on traditional herbal medicine for their primary health care needs. These valuable herbal traditions found in developing countries have always been considered an important component of the cultural heritage of the world and traditional use and management of medicinal plants.<sup>[1]</sup>*Securinega leucopyrus*, (Willd) Muell. (Family: Euphorbiaceae) known as **Katupila** (in Sri Lanka), **Thumri**(Sanskrit name), **Humari** (in Hindi), **Shinavi**(in Gujarat) and also called as "Spinous fluggea" in English<sup>[2]</sup>. It has long been used by the tribes of Srilanka and in India. Common in scrub jungles, limited to India, Srilanka and Burma. This is a common weed found all over Sri Lanka although it's a desert climatic plant. <sup>[3]</sup> It has been described by the medico-ethno-botanist as a wonderful drug for the treatment of wound healing. It is also useful in vitiated conditions of Pitta, burning sensation, strangury, seminal weakness and general debility and is used as a wonderful medicine in menstrual disorders. It consists of quasitrin, albumin, resins and coloring agents. *Katupila* possesses *kashaya* and *Tikta rasas*; *Lagu*, *Ruksha*, *Tikshna gunas*; *Ushna veerya* and *Katu vipaka*. *Katupila* leaves act as an antiseptic and its paste is used in folklore to extract any extraneous materials from body tissues without surgery.<sup>[4]</sup> Extracts of leaves had exhibited in vitro broad spectrum antimicrobial activities. Juice or paste of leaves used along with tobacco to destroy worms in sores. Pharmacognostical study of *S. leucopyrus* powder shows the presence of calcium oxalate crystals, large amount of tannin and oil helpful in the treatment of cuts and wounds.<sup>[5]</sup> Sesame oil has *Vrana Shodhan* (wound cleaning) and *Vrana Dahanashaka* (relief in burning pain) properties will be used along with the paste.<sup>[6]</sup> This plant is yet to be scientifically evaluated as an effective drug for wound healing effects including diabetic wound in animal models. Since, review on *S. leucopyrus* was not available on one platform during extensive literature search it was thought worthwhile to undertake detailed review study. In this review massive effort was made to compile the details of plant consisting pharmacognosy, phytochemical constituents, antimicrobial activity and its uses.

## MATERIAL AND METHODS

*Katupila* reported as a miraculous medicinal plant in different research papers on wound healing potential. Material related to review on previous research work done on Pharmacognosy, Phytochemistry, Pharmacological and clinical activities; this is collected from various research papers, thesis and internet sources as PubMed indexed journals.

### Literature review:

There appears to have been very few works done on the therapeutic potential of the plant *S. leucopyrus*. The

entire Ayurvedic literature search did not yield any result regarding its taxonomical description as well as therapeutic application. However, it has been identified and described the drug in the illustrations of the forest flora of North-West and Central India, Dietrich Brandis <sup>[7]</sup> 1874 and it is also mentioned in the secondary forest situation in Sri Lanka- A Review –G.A.D. Perera (Department of Botany, University of Peradeniya). Flora of Saurashtra in Gujarat India, here, the plant is described under the name *S. leucopyrus* (wild) local name as "Humari" with some references.<sup>[8]</sup> Details of *S. leucopyrus* also found in Ethno-Veterinary Medicinal usage of Flora of Greater Cholistan Desert (Pakistan)<sup>[9]</sup> with its medicinal usage as "Poultice of leaves is applied to wounds to treat myiasis and promote healing." Further it is mentioned in "Studies on the Phytodiversity of a Sacred Grove and its Traditional Uses in Karaikal, India".<sup>[10]</sup>

### Geographical distribution:

The plant is distributed to India, Sri Lanka and Burma. It is distributed all over India, In Gujarat it is distributed specially in Kutch and Saurashtra region,<sup>[11]</sup> Div, Junagarh, Tulshishyam, Junvania, Sasan.<sup>[12]</sup> Barda hills.<sup>[13]</sup>

### Review of previous work:

1. Micromorphological and micrometric evaluation of *Securinega leucopyrus* (willd) muell. Leaf and stem-unexplored drug.<sup>[14]</sup>
2. Investigation of In-Vitro Anti-Oxidant, Anti-Inflammatory and Anti-Arthritic Activity of Aerial Parts of *Securinega leucopyrus* (Willd.) Muell.<sup>[1]</sup>
3. Antimicrobial activity of *Securinega leucopyrus*<sup>[15]</sup>
4. Antifungal Activity of Securinine against some Plant pathogenic Fungi.<sup>[16]</sup>
5. Evaluation of antioxidant and antiproliferative activity of *Flueggea leucopyrus* Willd (katupila). <sup>[17]</sup>
6. In vitro antioxidant activity of chloroform extract of aerial parts of *Securinega leucopyrus* (willd.) Muel.<sup>[18]</sup>
7. Synthesis of silver nanoparticles using extracts of *Securinega leucopyrus* and Evaluation of its antibacterial activity.<sup>[19]</sup>
8. Isolation, Frequency Distribution and Diversity of Novel Fungal Endophytes in *Securinega leucopyrus* L. From Sanganer Region of Rajasthan.<sup>[20]</sup>
9. Chemical synthesis and biological activities of Securinega alkaloids.<sup>[21]</sup>
10. Synthesis and biological evaluation of new securinine analogues as potential anticancer agents.<sup>[22]</sup>
11. An Approach to the Skeleton of the Securinega Alkaloids. The Total Synthesis of (±)- Securinine.<sup>[23]</sup>
12. Modulation of expression of heat shock proteins and apoptosis by *Flueggea leucopyrus* (Willd) decoction in three breast cancer phenotypes.<sup>[24]</sup>
13. Cytotoxic and Apoptotic Effect of the Decoction of the Aerial Parts of *Flueggea leucopyrus* on Human

Endometrial Carcinoma (AN<sub>3</sub>CA) Cells.<sup>[25]</sup>

14. Katupila (*Securinega leucopyrus*) as a potential option for Diabetic Wound management.<sup>[26]</sup>
15. Topical application of Katupila (*Securinega leucopyrus*) in *Dushta Vrana* (chronic wound) showing excellent healing effect: A case study.<sup>[27]</sup>
16. Management of Madhumehajanya Vrana (diabetic wound) with Katupila (*Securinega leucopyrus* [Willd] Muell.) Kalka.<sup>[28]</sup>
17. Diabetic Wound Treated With Herbal Paste of *Securinega Leucopyrus* (Willd.) Muell - Case Report. <sup>[29]</sup>
18. Management of Vicharchika (Eczema) with *Securinega Leucopyrus* and Sesame Oil: A Case Study. <sup>[30]</sup>

### Pharmacognosy:

The review on Pharmacognosy portion of *S. leucopyrus* consist of its botanical description, transverse sections of leaf and stem with powder microscopy. The detailed microscopy of bark, root and other parts of the drug is still to be studied for its complete evaluation.

### Botanical description:

**Synonyms** <sup>[31]</sup>: *Flueggea leucopyrus* (koen.) Willd., *Securinega leucopyrus* (willd.) Muell.-Arg.

*Securinega leucopyrus* is erect slender shrub, 1.5 to 2 meter tall, bark smooth, ash coloured in younger parts and blackish- brown in older. Wood hard and close-grained.

**Leaves:** Leaves simple, alternate, moderate sized, distichious, thin stipulate, stipules lanceolate. 3-5 cm long and 1-1.5 cm broad, coriaceous oblong to elliptic in shape. Apex obtuse, venation reticulate 6-8 veins and many veinlets. Upper dark green lower parrot green in colour,

**Inflorescence:** Inflorescence axillary fascicles.

**Male flowers:** Pedicels 2-5 mm; sepals 5, ovate or rotund, 0.6-1.2 × 0.6-1.2 mm, margins entire or denticulate; disk segments 5, angular; stamens 5; filaments 0.8-1.8 mm; anthers 0.3-0.5 mm; rudimentary ovary 0.6-1.2 mm high, 2- or 3-lobed, lobes erect or recurved.

**Female flowers:** Pedicels 1.2-2.8 mm; sepals 5, elliptic or ovate, 0.6-0.8 mm; disk annular, sub entire at apex; ovary ovoid, 2- or 3-locular; styles 0.6-0.9 mm, connate at base, bifid at apex. Female flowers fewer than male flowers.

**Berry:** Fruits about 6 mm in diameter, subglobose or spherical, white with a fleshy pericarp. Tepals persist at the base of the fruit and styles persist at the apex. Fruits are whitish in colour when ripe.

**Seeds:** Seeds rounded at back, minutely punctate, brownish in colour, 1.9-2.5 mm, smooth; hilum invaginated. Flowers appear in April to July & fruits from July to October. On the concave side of the seed the testa intrudes



into the endosperm. Embryo is white. Cotyledons are much wider than the radicle.

### **Transverse section of petiole of leaf:**

The transverse section of the petiole shows outer single layered compactly arranged barrel shaped epidermal cells covered with cuticle followed cortex. Cortex widely distributed, made up of parenchyma cells, large number of rosette and prismatic crystals of calcium oxalate, oil globules are also present. A ring of pericyclic fibres covers the vascular bundles. Vascular bundles consists of one large vascular in the centre. Each bundle is conjoint, collateral, surrounded by a parenchymatous bundle sheath. Vascular bundles radially arranged metaxylem towards periphery, proto-xylem towards centre. Xylem consist xylem parenchyma and its fibres. Phloem present below the xylem with some sieve elements.

### **Transverse section of leaf through mid-rib:**

Detailed T.S. shows upper and lower epidermis covered with thick cuticle. Lower epidermis made up of somewhat papillae like parenchyma cells. Lamina shows 2-3 layers of palisade underneath the upper epidermis and 3-4 of rows of spongy parenchyma traversed with obliquely cut vascular bundles and rosette crystals of calcium oxalate. Section passing through the midrib shows collenchymatous tissue is located underneath both the epidermis. Vascular bundles consists of one large vascular in the centre. Each bundle is conjoint, collateral, surrounded by a parenchymatous bundle sheath. Vascular bundles radially arranged metaxylem towards periphery, protoxylem towards centre. Xylem consist xylem parenchyma and its fibres. Phloem present below the xylem with some sieve elements.

### **Surface preparation of leaf:**

Thin upper and lower surface prepared by simple peeling method the lower epidermis shows the numerous stomata, whereas upper epidermis devote of stomata, stomata mainly of anamocytic, epidermal cells, prismatic and rosette crystals of calcium oxalate and large quantities of oil globules distributed all over the surface.

### **Powder microscopy of leaf:**

Organoleptic characters shows leaf powder is dark green in colour, astringent in taste, aromatic in odour and coarse in touch. Diagnostic powder microscopic characters were oil globules, prismatic and rosette crystals of calcium oxalate, anamocytic stomata. Epidermal cells, fragments spiral vessels, lignified fibres.

### **Transverse section of stem:**

The diagrammatic section is somewhat quadrangular in shape, shows outer epidermis followed by

cortex along with the peri cyclic fibre zone, radially arranged vascular bundles and centrally located large parenchymatous pith. Outer layer composed of barrel shaped 3-5 rows of cork cells, inner cells filled with tannin content. Cortex made up of compactly arranged parenchymatous cells, some of the parenchymatous cells are filled with prismatic crystal of calcium oxalate, simple starch grains with hilum and oil globules. Endodermis single layered somewhat elongated with thin walled parenchymatous cells forming ring like structure. Pericyclic fibers situated above the xylem forming an arc like structure, and are lignified. Medullary rays uniserrate, separates the vascular tissues, somewhat longitudinally arranged barrel shaped cells filled with some oil globules and starch grain. In vascular bundles metaxylem towards periphery and protoxylem towards pith, xylem consists of xylem parenchyma and fibres, phloem situated above xylem forming cap like structure with few elements and fibre. Pith covers nearly half portion of the section, made up of thick walled, compactly arranged parenchyma cells with some prismatic crystals and oil globules. Tail region of the vascular bundle consist of thick walled lignified pitted parenchyma cells, loaded with starch grains.

### **Powder microscopy of stem:**

Stem powder light yellow in colour, astringent in taste with characteristic odour. The diagnostic characters of the stem powder shows Tannin content, cork in surface view, Prismatic crystal of calcium oxalate, lignified fibres, pitted vessel, fibre with lumen and oil globule.

### **Phytochemistry:**

The review on Phytochemistry portion of *S. leucopyrus* includes physicochemical parameters of leaves and bark powder and quantitative analysis of alkaloids, terpenoids, unsaturated sterols, glycosides, saponins, phenolics, flavonoids, tannins, carbohydrates and protein present in this plant. However the detail phytochemical evaluation is still to be studied.

### **Physicochemical parameters:**

Following parameters were employed for the analysis of powder of *S. Leucopyrus*.

<b>Parameters</b>	<b><i>Katupila</i> leaves Powder</b>	<b><i>Katupila</i> Bark Powder</b>
Loss on Drying at 1050 °C	3.87 % w/w	5.09% w/w
Total Ash	6.94 % w/w	2.68% w/w
pH value	4.5	5.5
Water extract	38.6 % w/w	10.8% w/w
Alcohol extract	27.6 % w/w	11.6 % w/w

**Chemical Composition:[32]**

The leaves and the bark extracts shows the presence of alkaloids, terpenoids, unsaturated sterols, glycosides, saponins, phenolics, flavonoids, tannins, carbohydrates and protein. All the extracts gave positive results for the above screening tests. Quantitative analysis showed the presence of 0.13 % of alkaloids, 0.74 % of saponins and 1.15 % of tannins in the methanolic extract of the leaves and 0.02 %, 0.19 % and 1.62 % in the methanolic extract of the bark respectively. Total phenolics were 34.86 mg/g, 3.98 mg/g, 38.49 mg/g and 29.93 mg/g in gallic acid equivalent for the aqueous extracts of the leaves and the bark and methanolic extracts of the leaves and the bark respectively. Total flavonoids were 20.33 mg/g, 11.86 mg/g, 11.48 mg/g and 6.42 mg/g in quercetin equivalent for the aqueous extracts of the leaves and the bark and methanolic extracts of the leaves and the bark respectively. It was found that carbohydrates were present as 48.73 % and 53.07 %, in the leaves and the bark respectively whereas proteins were present as 21.20 % and 12.87 % in the leaves and the bark respectively. Further, the proximate analysis showed that moisture content, ash content, lipids content and fiber content were 10.20 g/100 g, 7.06 g/100 g, 1.50 g/100 g and 8.44 g/100 g in the leaves and 11.82 g/100 g, 6.03 g/100 g, 0.75 g/100 g and 14.56 g/100 g in the bark respectively. The elemental analysis revealed that nitrogen, sodium, potassium and phosphorus were 3.39 g/100 g, 0.37 g/100 g, 0.36 g/100 g and 0.01 g/100 g in the leaves and 2.06 g/100 g, 0.23 g/100 g, 0.27 g/100 g and 0.01 g/100 g in the bark respectively.

**Antimicrobial activity of *S. leucopyrus*:[33]**

In this screening work, the extract of *S. leucopyrus* at different concentrations was found to be comparatively highly effective against all organisms such as Gram positive, Gram negative and single fungal strain. From the above results the activity of all extracts shows significant antibacterial and antifungal activity. The present study justified the claimed ethnic uses of *S. leucopyrus* leaf and stem bark externally in ringworms, scurvy, snakebite, sprains, bruises, rheumatic swelling and to treat various infectious diseases caused by the microbes. However, further studies are required to isolate the active compounds from *S. leucopyrus* leaf and stem bark, responsible for the antimicrobial and antioxidant property which may lead to compounds in the field of antimicrobial and anti-cancer.

**Anticancer properties of *F.leucopyrus*: [34]**

For evaluation of cytotoxicity *SRB cytotoxicity assay* was performed according to the method of Samarakoon et al. Cytotoxic effects of the decoction of aerial parts of the plant on three breast cancer phenotypes [MCF-7, SKBR-3 and MDA-MB-231. Among the three breast cancer cell phenotypes, the decoction is more cytotoxic to the Her2 negative cell lines (MCF-7 and MDA-MB-231) than to Her2 positive cell line SKBR-3. The decoction also exhibits selective cytotoxicity to the breast cancer cells in comparison with the non-cancerous breast cell line MCF-10A. These results help to rationalize the ethno-pharmacological claims



regarding presence of anticancer properties in *F. leucopyrus*.

### **Pharmacology:**

The review on pharmacology part consists of In-vitro pharmacological evaluation of *S. leucopyrus*. In vivo study in animal models is still necessary so as to explore the plant regarding its medicinal importance.

### **In-vitro Pharmacological evaluation:** [1]

The aerial part of the plant of *S. leucopyrus* (willd.) Muell had been studied for its anti-oxidant activity by DPPH method (Yohozawa, 1998), nitric oxide scavenging activity (Alderson, 2001), determination of total anti-oxidant activity (Prieto, 1999) scavenging of hydroxyl radical deoxyribose method (Elizabeth, 1990), in-vitro anti-inflammatory activity by human red blood corpuscle (HRBC) membrane stabilization method, in-vitro anti-arthritic activity by inhibition of protein denaturation method.

### **Anti-oxidant activity by DPPH radical scavenging method:** [1]

The chloroform and ethyl acetate, alcohol, hydro alcohol extracts showed a dose dependent increase in anti-oxidant activity in DPPH method. About 82.5%, 88.42% were observed in Chloroform and Alcoholic extracts of *S. leucopyrus*. But in Hexane extract the effect was decreased when dose increases. The presence of flavanoids, alkaloids, tannins and steroids in these extracts may be responsible for free radical scavenging activity. From the results it is made clear that *S. leucopyrus* possess free radical scavenging property and the order was, Alcohol > Chloroform > Ethyl acetate > Hydro alcohol > Hexane. DPPH is a relatively stable free radical. The assay is the measurement of scavenging ability of antioxidants towards the stable radical DPPH. The plant containing flavanoids, alkaloids, tannins and steroids reduces the radical to the corresponding hydrazine when it reacts with a hydrogen donors in the anti-oxidant principle. In DPPH method results are highly reproducible. The active constituent present in the plant donates an electron to reduce the DPPH radical to its corresponding hydrazine. The chemical constituents present in this plant like flavanoids, tannins, alkaloids and steroids may be responsible for this activity. They show the anti-oxidant activity by inhibition of enzymes involved in oxidation systems.

### **Anti -oxidant activity by nitric oxide scavenging method:** [1]

All extracts of *S. leucopyrus* shown a dose dependent increase in nitric oxide scavenging property. About 85% inhibition was observed by hydroalcoholic extract. But in hexane and ethyl acetate extracts the effect was very less compared to standard. The presence of flavonoids tannins and steroids in these extracts may be responsible for Nitric oxide scavenging activity. Nitric oxide is a radical produced in mammalian cells, involved in the regulation of various physiological processes. In the present study the



nitrite produced by the incubation of sodium nitro prusside in standard phosphate buffer at 25° c was reduced by plant extract. This may be due to the anti- oxidant principles present in the plant extract which compete with oxygen to react with nitric oxide, there by inhibiting the generation of more deleterious products such as nitric anhydride (N<sub>2</sub>O<sub>3</sub> ) and perhydroxy nitrite (ONO ---) (Chen et al 2001). This activity is due to the presence of flavonoids, tannins and steroids. They inhibit the free radicals by inhibition of enzymes involved in oxidation systems (5- lipoxygenase, cyclooxygenase, mono oxygenase, xanthine oxidase).

### **Determination of total anti-oxidant activity:** [1]

The ethanolic, hydro alcoholic extracts showed maximum effect due to the presence of flavanoids, reducing sugars, alkaloids, tannins and steroids. The values were expressed as equivalents of vitamin E. From the results it is made that *S. leucopyrus* possess free radical scavenging activity through anti-oxidant property.

### **Anti-oxidant activity by hydroxy radical scavenging method:** [1]

All the extracts of *S. leucopyrus* shown a dose dependant increase in nitric oxide scavenging property. About 87.11% inhibition was observed by alcoholic extract. The chloroform and hydroalcoholic extract showed 78.56%, 78.52% inhibition. But in ethyl acetate and hexane extract the effect was very less compared to standard. The presence of flavanoids tannins and steroids in these extracts may be responsible for hydroxy radical scavenging activity. Ferrous salts can react with H<sub>2</sub>O<sub>2</sub> and form hydroxyl radical via Fenton's reaction. The iron required for this reaction is obtained either from the pool of iron or the heme containing protein. The hydroxyl radical (OH)- thus produced may attack the sugar of DNA deoxy causing ribose fragmentation, base loss, and DNA strand breakage. The generation of (OH)- in fenton reaction is due to the presence of iron ions. When the Fe<sup>2+</sup>/Fe<sup>3+</sup> redox couple is bound by certain chelators, the OH fragmentation is prevented, whereas the increased colour formation in the absence of crude extracts were observed in deoxy rebose assay. In this, the extract act as a chelator of iron ions , binding to them, & preventing the formation of free radicals, though the extracts not directly involved in the OH scavenging . The results indicate that the extracts of plant play a major role in the inhibition of ribose fragmentation and hence the decreased color formation in the deoxy rebose assay. The free radical scavenging property of the crude extracts of plant against DPPH, Nitric oxide, Hydroxy radicals and the total anti-oxidant activity is clearly understood from the results of this chapter. The phytochemical screening of the extract revealed the presence of flavonoids, tannins which is responsible for anti-oxidant property.

### **Anti-inflammatory activity by HRBC membrane stabilization method:** [1]

The all extracts shows a dose dependent increase in anti-inflammatory activity in HRBC membrane stabilization method. About 89.66%, 87.42%, 72.32% inhibitions were observed in ethyl acetate, chloroform and alcoholic extracts. But in hexane and hydro alcoholic extracts the effect was very less when compared to

standard diclofenac sodium. This anti-inflammatory activity may be due to the presence of flavonoids, tannins and alkaloids. Flavonoids may produce their anti-inflammatory effect by a multitude of ways to inhibit the inflammatory processes. Formation and release of various mediators of inflammation like histamine and prostaglandin are affected by flavanoids. They inhibit the increased capillary permeability during inflammation. The adhesion of leucocyte to endothelial surface and subsequent migration is influenced by flavanoids. They inhibit the prostaglandin and Leucotriene C<sub>4</sub> in human platelet. They were investigated for lipoxygenase inhibitory activity. They inhibits cytokine release from cells.

### **Anti-arthritic activity by inhibition of protein denaturation method: [1]**

The Ethanol, Chloroform, Hydro alcoholic extracts showed maximum activity when compared to n-Hexane and Ethyl acetate extracts. The effect is represented as, Ethanol > Water > Chloroform > Ethyl acetate > Hexane extracts. The effect may be due to alkaloids, tannins, flavanoids, triterpenes and reducing sugars. Denaturation of protein is one of the causes of rheumatoid arthritis. Production of auto antigen in certain arthritic disease may be due to denaturation of proteins. The mechanism of denaturation probably involves alteration in electrostatic hydrogen's and hydrophobic di sulphide bonding. The present study, *S. leucopyrus* capable of controlling the production of auto antigens and thereby it inhibit the denaturation of protein in rheumatic diseases.

## **DISCUSSION**

The present article deals with an up-to-date review on the pharmacognosy, phytochemistry and pharmacology of *S. leucopyrus*, a useful medicinal plant from *Euphorbiaceae* family. Botanical description taken from different sources helps us to physically identification. Some research articles and case studies reviews highlighted its clinical efficacy in tissue healing. The results from this review are quite promising for the use of *S. leucopyrus* as a multi-purpose medicinal agent. Further exhaustive research regarding isolation of more photochemical and pharmacology study on this medicinal plant is still necessary so as to explore the plant regarding its medicinal importance. Therefore, the aim of this review is to boost up present day researches in this direction to undertake further investigations of this plant. We do anticipate that this plant will be much effective in drug development programmed in near future.

## **CONCLUSION**

This article highlights Animal experiments trialed to prove anti-inflammatory, antimicrobial, anticancer, anti-oxidant activity and anti-arthritic activities of different extracts forms. These experimental studies help to find out applications in human beings through indigenous systems of medicine.

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