**ABSTRACT**

Herbal medicine has become a medicinal as well as the economic aspect of global significance. While the use of these herbal medicines has increased, there are several questions about their consistency, protection, and effectiveness in different countries. Boswellic acid (BA) is one of the active constituents obtained from plant *Boswellia serrata* (BS) family Burseraceae. The oleoresin gum of the plant is also known as Salai guggul, Indian olibanum, or Indian frankincense. *Boswellia* species comprises a variety of phytochemical components, essential oil, BA such as keto-BA, beta-BA, or acetyl keto-BA. This variety of constituents isolated from the plant using various extraction processes such as hydrodistillation, percolation, and ultraviolet-assisted extraction or solvent extraction. The active constituent has different biological activities such as antiulcerative, antioxidant, anti-inflammatory, or antitumor activity. This review seeks to update information on plant BS with its medicinal uses, isolation process in the traditional or Indian system of medicine, and justify its use on modern scientific parameters.

**Keywords:** Natural herb, *Boswellia serrata*, Terpenic acid, Acetyl keto-boswellic acid, Keto-boswellic acid, Anti-inflammatory agent.

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**INTRODUCTION**

In drug research and growth, natural products are receiving expanded applications. They are chemical rich and can concurrently modulate multiple targets in a complex structure. The use of herbal medicines and phytonutrients continues to expand exponentially all over the world, with many people being exposed to such products in various national health-care settings to tackle different health problems. [1] *Boswellia serrata* (BS) extract is one of the most effective herbal drugs, which is popularly known as the sallaki, indigenous olibanum of frankincense, and laban. There are more than 25 species grown worldwide such as *Boswellia carteri*, *Boswellia sacra*, and *Boswellia papyrifera*. BS is commonly cultivated in gulf countries such as Saudi Arabia and East Africa. Indian states where it is grown widely include Orissa, Bihar, Gujarat, Rajasthan, Uttar Pradesh, and Madhya Pradesh [2].

The dry exudate from the *Boswellia* trees bark is a resin of the oleo gum. The extraction of a particular pharmacological active ingredient can be carried out using various extraction methods such as solvent extraction, hydrodistillation, and solvent extraction. This extraction requires various plant parts such as leaves, base, stem, and even a whole *Boswellia* plant. This extract can be used to cure a number of inflammatory disorders such as Crohn's disease and colitis ulcerations. Both extract and essential oil are used as antiseptic in both mouth washing and asthma with cough care [3].

The resin portion of almost all species of *Boswellia* consists mostly of boswellic acid (BA) and pentacyclic triterpene. Among all BAs, 11-keto β-BA and acetyl keto β-BA are the most potent anti-inflammatory agents that selectively inhibit leukotrienes by inhibiting 5-lipoxygenase (5-LOX) in a non-competitive, non-redox, and enzyme directed manner [4,5].

**TAXONOMICAL HIERARCHY - [6].**

- Kingdom – Plantae.
- Subkingdom – Tracheobionta.
- Division – Magnoliophyta.
- Class – Magnoliopsida.
- Order – Sapindales.
- Family – Burseraceae.

**EXTRACTION PROCESS**

Extraction constitutes the first step in separating the natural materials extracted from the raw material. The general strategies for extracting medicinal plants include maceration, infusion, percolation, digestion, decoction, hot continuous extraction (Soxhlet), aqueous alcoholic extraction by fermentation, counter-current extraction, microwave-assisted extraction (MAE), ultrasound extraction (sonication), supercritical fluid extraction, and distillation techniques (water distillation, steam distillation, and photonic extraction [with hydrofluorocarbon solvents]). For aromatic plants, hydrowater, and steam distillation), hydrolytic maceration followed by distillation, expression, and effleurage (cold fat extraction) may be employed [7]. Some of the latest extraction methods for aromatic plants include headspace trapping, solid-phase microextraction, proplast extraction, and microdistillation. As the plant and isolated compounds are well known for their therapeutic properties and use in Ayurveda, each of the extraction methods can be used to achieve the optimum yield of the desired compound for the intended extraction of some particular compound from the plant extract [8].

Various researchers utilized some of the above-mentioned methods for the extraction of the active compounds from *Boswellia serrata*. Some important description from their study has been enlisted in the following.

**THREE-PHASE PARTITIONING (TPP)**

TPP is a fast, effective, and green bioseparation process and often a one-step process to isolate and purify active compounds from complex...
mixtures [9]. This method involves the concept of various techniques such as salting out, isionic and cosolvent precipitation, and osmolyte and kosmotropic precipitation. The theory of this rapidly evolving method is to combine crude extract with solid salt mostly ammonium sulfate and organic solvent typically t-butanol to achieve three phase [10,11].

PERCOLATION

Percolation refers to the transfer and filtration of liquid by porous materials. The crude material being extracted is reduced to pieces of suitable size. If necessary, then mixed thoroughly with a portion of the specified solvent and allow to stand for 15 min [12]. The mixture is moved to a percolator an appropriate quantity of specified solvent is applied to cover entire solid mass and the mixture can percolate slowly at a rate of 1 mL/min, with 1000 g of raw material. The matter to be extracted is always covered with a layer of solvent. The residue can be pressed and the fluid obtained is mixed with the percolate and usually concentrated by distillation at low pressure [13].

ULTRASONIC-ASSISTED EXTRACTION (UAE)

Using ultrasound resulted in better separation of materials in a shorter period and at a lower temperature. The mechanical effect of ultrasound will facilitate the extraction of active plant components by the destruction of the cell walls [14]. Nowadays, UAE has been used to extract pharmaceutically active compounds such as polysaccharides, cellulose, flavonoids, saturated hydrocarbon, fatty acid, ester, and steroids from different parts of the plant. UAE is based on the transmission of mechanical waves, generated by the sequence of cycles described as the combination of high and low pressure, called compression and rarefactions [15].

SUPERACRITICAL FLUID EXTRACTION

The supercritical condition is the state in which the temperature and pressure of the substance are above the critical values where gas and liquid cannot be separated from one another [16]. The solvent in supercritical state exhibits intermediate physiochemical properties identical to liquid and gas, which improves the solvent extraction capacity [19]. Supercritical carbon dioxide is the most commonly used of the numerous supercritical fluids (ethylene, methane, nitrogen, xenon, or fluorocarbons) used for extraction, as it is non-toxic, non-flammable, non-corrosive, and easy to handle allowing supercritical activity at low pressure and near room temperature [17,18].

HYDRODISTILLATION

Distillation methods have traditionally been applied in the analysis of plant materials. Hydrodistillation represents a commonly used method of extracting essential oil from plant parts [22]. This method may be further classified into the subcategories of steam distillation, water distillation, and both. The main advantage of this method is that less processing time and higher oil yield. Heat and steam allow the plant material’s cells structure to burst and breakdown, thereby releasing essential oils [21,23].

SOXHLET EXTRACTION

A Soxlet extractor is a piece of laboratory apparatus designed in 1879 by Franz von Soxhlet. The configuration of the Soxhlet extractor consists of a round bottom flask, siphon tube, distillation path, expansion adapter, condenser, water inlet for cooling, water outlet for cooling, heat source, and thimble [24]. In this method, the powdered sample is enclosed in a porous bag or “thimble” made from a strong filter paper or cellulose, which is placed, is in the thimble chamber of the Soxhlet apparatus [20]. The extraction solvent is taken in the round bottom flask and heated using a heating source like heating mantle [25].

MACERATION

Maceration is a well-known extraction procedure where phenolic components such as tannins, coloring agents (anthocyanins), and flavor chemicals are extracted from the various parts of the plant [11]. In the maceration process, the plant material is placed in peaces or powder, depending on convenience, in a container full of menstrum and let stand for 3 or more days, shake frequently until complete extraction of plant material. The material is then compressed and pressed to extract all of the excess oil into the resulting solid. The accumulated material is condensed by filtration or decanting. The overall maceration time depends on the type of plant to be extracted, or part of it, or the active ingredient. The most conspicuous ratio is 1:20 herb/liquid [26].

MICROWAVE-ASSISTED

MAE is a method used in the 1990s to isolate the organic substances from solid materials (microwave digestion has been used in metal analysis for many years). The approach involves simply placing the sample in a specialized container with the solvent and using microwave energy heating the solvent [27]. When collecting samples by MAE, two choices are available: Open vessel and closed vessel, and the decision is primarily influenced by the nature of the solvent used. In general, MAE uses a small quantity of solvents and it is called a “Green” system and also heating occurs in an environmentally selective manner, with even less energy loss [28,29].

STEAM DISTILLATION

Steam distillation is accomplished by passing dry steam through the plant material, volatilizing, condensing, and collecting the steam volatile compounds in the receivers. Steam distillation has been in use for many years for extracting essential oil [30]. It is a multistage continuous distillation process, where steam is used to extract the oils as a removing gas. Steam is directed through the content of the plant. The hot vapor mixture is collected and condensed to produce a liquid in which the oil and water form two distinct layers. One of these layers is essential oil, which contains oil-soluble compounds, and the other is a hydrolysate or hydrosol, which contains water-soluble components [31].

Table 2 gives a brief idea about various researches on Boswellia extraction process.

CHEMICAL CONSTITUENTS

Oleo gum resin of BS has numerous active chemical constituents and pharmacologically active elements such as terpenoids and oil [32,33]. The content and composition may vary by species depending on age, resin quality, and geographical condition. The oleo gum contains resins (30–60%), essential oil (5–10%), and water-soluble polysaccharides (~65%) arabinose, galactose, and xylose) (BS monograph 2008). The essential oil of Salai guggul mainly contains monoterpenoids (α-pinene, cis-verbenol, trans-pinocarveol, borneol, myrcene, phellendrene, cadinene, verbenone, limonene, and a small amount of diterpenes). α-pinene (73.3%) is the major chemical constituent of monoterpenoid [34,36].

Table 1: Pharmacognostical features of plant

| S. No. | Parts               | Features                                      |
|-------|---------------------|-----------------------------------------------|
| 1.    | Leaves              | Odd pinate, length 30–45 cm long, ex-stipulate, variable in shape, crowded at branch |
| 2.    | Leaflets            | 8–15 in numbers, ovate or ovate-lanceolate, rounded base, almost sessile, mostly pubescent |
| 3.    | Flower              | Bisexual, axillary racemes, or panicles at the top of the branches |
| 4.    | Calyx               | Smaller, pubescent outside, 5–6 lobed broadly triangular-ovate |
| 5.    | Petals              | 5mm long oblong-ovate with the basal disk, white–pink in color |
| 6.    | Fruits              | Cotyledons, trifid, drupe, 1.25 cm long trigonous obovoid type |
| 7.    | Seeds               | Heart-shaped, attached to the inner angle of the compressed and multifid cotyledons |
Table 2: Extraction techniques with their conditions

| S. No. | Technique                  | Solvent                          | Condition                  | Active constituent                  | Max. yield |
|-------|---------------------------|----------------------------------|----------------------------|-------------------------------------|------------|
| 1.    | Three-phase partitioning  | t-butanol dichloromethane         | 3–4 h 2–3 h 3–8 h 10–24 h | Acetyl keto-boswellic acid           | 35–40%     |
| 2.    | Percolation               | Ethanol Pet. ether Acetone Methanol | 50–1000 ml solvent used 24 h | Boswellic acid                      | 25–30%     |
| 3.    | Ultrasonic assisted       | Pet. ether Ethanol Methanol       | 50–300 ml solvent 2–3 h 20–25 kHz 150–200 W | Acetyl keto-boswellic acid           | 40–60%     |
| 4.    | Supercritical fluid extraction | Carbon dioxide                  | 100–250 bars 40–45°C 40–70°C | Boswellic acid                      | 45–50%     |
| 5.    | Soxhlet extraction        | Ethanol Hydroalcohols Pet. ether Hexane Methanol | 10–24 h 300–500 ml 3–8 h 160°C | Carbohydrates Tannins Glycoside Terpenes | 45–55%     |
| 6.    | Hydrodistillation         | Distilled water                  | 1:1 ration 8–10 h 11 | Essential oils Boswellic acid | 2–5% 3–10% |
| 7.    | Maceration                | Water Ethanol Hydroalcohols      | 6–12 h 100°C | | |
| 8.    | Microwave assisted        | Distilled water                  | 6–12 h 100°C | | |
| 9.    | Steam distillation        | Distilled water                  | 100°C | | |

Table 3: Identification test for various active constituents

| S. No. | Test                | Chemical used                      | Inference                                      |
|-------|---------------------|------------------------------------|------------------------------------------------|
| 1.    | Killer-Killani test | Glacial acetic acid, ferric chloride, | Reddish-brown color at the junction of two layers with bluish-green color at the top shows the presence of glycosides |
| 2.    | Salkowski’s test    | Chloroform, sulfuric acid          | Reddish-brown band shows the presence of terpenoids |
| 3.    | Shinoda test        | Ethanol, hydrocholic acid, magnesum | Color change from violet to blue shows the presence of flavonoids |
| 4.    | Liebermann-Burchard test | Acetic anhydride, sulfuric acid | The appearance of the blue color shows the presence of tannins |
| 5.    | Ferric chloride test | Water, ferric chloride             | Formation of stable persistent foam shows the presence of saponins |
| 6.    | Foam test           | Distilled water                    | The formation of cream precipitate shows the presence of alkaloids |
| 7.    | Mayer’s reagent test | Hydrochloric acid, potassium iodide | |

Table 4: Mechanism of action along with some formulation

| S. No. | Activity       | MOA                              | Formulations                        |
|-------|----------------|----------------------------------|-------------------------------------|
| 1.    | Anti-inflammatory | ↓ 5-LO, 1-5 LOX, 1-COX-2   | Tablet/herbal gel/cream/patch         |
| 2.    | Antimicrobial   | ↓ Antimicrobial peptide IL-16, IL-1β | Gel/cream/silver nanoparticle     |
| 3.    | Anticancer      | ↓ NF-kB, AKBA, VEGF2             | Solid lipid nanoparticle            |
| 4.    | Improving memory | Regulating the Nrf2/     | Tablet                             |
| 5.    | Antioxidant     | Regulating the Nrf2/     | Silver nanoparticle                 |

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5-LO: 5-Lipoxygenase, HLE: Human leukocyte elastase, 5-LOX: 5-Liperoxidase, TNF-a: Tumor necrosis factor-a, (IL-β): Interleukin-1 beta, COX-2: Cyclooxygenase-2, NF- kB: Nuclear factor-kappa B, VEGF2: Vascular endothelial growth factor receptor 2, GSH: Glutathione, Nrf-2: The nuclear factor erythroid 2 (NFE2)-related factor 2, HO-1: Heme oxygenase-1

**PHYTOCHEMICAL EVALUATION**

Phytoconstituents are the bioactive chemical compounds present in the plants [39,40]. These phytoconstituents work with nutrients and fibers to form an essential part of the protection mechanism against specific diseases and stress conditions. Qualitative analysis as well as quantitative phytochemical analysis are the important application of biomedicine in pharmaceutical industries [41,42]. The phytochemical analysis was very useful in identifying chemical compounds in plant material which led to their quantitative estimate and the position of the pharmacy. There are some tests mentioned in Table 3, which help to screening the presence of active compound in the plant.

**APPLICATIONS**

**ANTI-INFLAMMATORY**

Arthritis is characterized by systemic inflammation, which can be related to pain, rigidity, and joint damage. Arthritis can be of different types which directly affect more than 1 joints such as fingers, ankles, and elbow depending on the type of arthritis. Gum resin extracts of *B. serrata* have been traditionally used in folk medicine for centuries to treat various chronic inflammatory diseases [45]. The data of numerous scientific studies support the claim that *B. serrata* possesses potent anti-inflammatory and anti-atherosclerotic activity. Su et al., 2011, have reported the anti-inflammatory activity as well as the analgesic effect of BA with a combination of Myrrha [43]. Agarwal et al., 2013, have prepared a herbal gel containing Boswellia extract for the treatment of arthritis. Some study reported that BA is as a direct 5-LO inhibitor, suppressing the synthesis of 5-LO products in common in vitro models [44]. Natural Boswellia extract compounds also exhibit anti-inflammatory properties in human peripheral mononuclear blood cells and mouse macrophages by inhibiting tumor necrosis factor-
alpha (TNF-α), interleukin-1 beta (IL-1 β), NO and mitogen-activated protein kinases, and incensole acetate, a novel anti-inflammatory compound isolated from *Boswellia* resin inhibits nuclear factor-kappa B activation [46,47].

**ANTIMICROBIAL**

Various studies have reported that crude extract of *Boswellia* species contains an antimicrobial agent that stops the further growth of microbes [60]. Kora *et al.*, 2012, to the prepared silver nanoparticle of aqueous extract of *Boswellia* which acts as an antimicrobial agent on both Gram-positive and Gram-negative bacteria [48]. Ismail *et al.*, 2014, have reported the antimicrobial activity of frankincense on both Gram-positive and Gram-negative bacteria. Other studies also reported that the gum resin of frankincense is active against *Staphylococcus aureus*, *Escherichia coli*, *Klebsiella* species, *Pseudomonas aeruginosa*, *Proteus mirabilis*, and *Bacillus subtilis* [49]. In addition to this, De Rapper *et al.*, 2012, have reported *B. serrata* EO α-pinene (38.41%) and myrcene (15.21%), while *Commiphora myrrha* EO was characterized by a high content of furanoeudesma-1,3-diene (17.65%) followed by curzerene (12.97%), β-elemene (12.70%), and germacrene-β (12.15%) having both an antimicrobial and antifungal activity [50]. Vahabi *et al.*, 2020, have reported antimicrobial activity of BS extract by disk diffusion or well plate method and broth microdilution method [51].

![Fig. 1: Boswellia serrata roxbH](image-url)
ANTIVIRAL
According to the researcher, Boswellia species also possess having an antiviral activity. Arora et al., 2020, have reported the antiviral activity of frankincense against CHIKV and both compounds blocked the entry of lentiviral vectors and prevented in vitro infection with CHIKV. Similarly, vesicular stomatitis virus particles and viral infections were also inhibited to the same degree, suggesting a strong antiviral activity [52]. Badria et al., 2003, have also reported antiviral activity of different constituents obtained from Boswellia species against herpes simplex type 1 virus and were able to reduce the number of the plaques by 100% with a minimum antiviral concentration at 20 μg/ml and followed by acetyl-11-keto-β-BA (75% inhibition at 20 μg/ml). β-boswellic and total alcoholic extract (50% inhibition at 40 μg/ml), acetyl-β-boswellic and 11-keto-β-boswellic (75% inhibition at 80 μg/ml), 3-hydroxytricarlic acid, 3-oxo-tricarlic acid, acetyl-α-BA, and total volatile oil (50% inhibition at 80 μg/ml). On the other hand, gum, palmitic acid, and heapeol reduced the number of plaques by 25% at relatively higher concentrations [53]. This shows that BS also exhibit antiviral activity.

ANTICANCER AND ANTITUMOR
BA anticancer activity has been documented in many studies. Takahash et al., 2012, have reported AKBA as a chemoprotective agent in colorectal cancerous cells by modulating specific micro-RNA pathways [54]. Schmich et al., 2019, have reported the correlation of boswellic and lupenic acid contents with TNF-α, IL-1β, IL-6, IL-8, and IL-10 inhibition. They also exhibited toxicity against the human triple-negative breast cancer cell lines MDA-MB-231, MDA-MB-453, and CAL-51 in vitro [55]. Khan et al., 2016, reported that BA significantly inhibited the ascetic and solid Ehrlich tumor model [56]. The inhibition was observed with reduced ascetic volume, solid tumor volume, and body weight when compared to that of control mice. A treatment also increased the survival of tumor-bearing mice. Vascular endothelial growth factor and TNF-α levels were decreased, whereas the IL-12 levels were increased with BA treatment at 25 mg/kg. Further, results on the decrease in the peritoneal angiogenesis and microvessel density showed the antiangiogenic potential [57,58].

ANTIDEPRESSANT ACTIVITY
The extract obtain from the plant is used as aromatherapy also in various tea formulations. B. serrata has been reported to be successful on an acute depression scale. PrabhaKhar et al., 2013, illustrated this at a dosage of 100 mg/kg. Boswellia has significant antidepressant efficacy in acute stress experiments and reduces the immobility time in the experimental forced swim model [59]. B. serrata, traditionally important medicinal plant, proved to be a bacteriostatic agent.

ANTI-ALZHEIMER'S ACTIVITY
Alzheimer's disease (AD) is a neurodegenerative, chronic condition. Increased oxidative stress in AD has proved to be a popular and early feature [60]. Medicinal plants with antioxidant activity have widely been used in treating a variety of human diseases. Yassin et al., 2013, have reported that Boswellia has the potential to treat the AICL-induced Alzheimer by elevation of Ach level and reduction of AChE activity in brain homogenates [61,62]. Beheshti et al., 2016, have also reported that frankincense has the potential to improve dementia type of AD induced by icv injection of streptozotocin in a time-dependent manner [66].

MISCELLANEOUS
Various study also have found that the boswellic acid is used in treatment of various disease mention in Table 4 including that, prepared a solid lipid nanoparticle combined with frankincense and myrrh oil which increased the antitumor efficacy in H22-bearing Kunming mice [63]. Togni et al., 2014, also prepared a topical formulation for the treatment of psoriasis and eczema [64]. TaghiZadeh et al., 2017, were performed a study to investigate the effect of a tablet containing BS extract and Melissa officinalis extract on the memory of the older adults and found that they can be beneficial on the improvement of memory [65].

SAFETY AND BIOAVAILABILITY ENHANCEMENT OF FRANKINCENSE
Based on the observations and results obtained from different research, it can be stated that the B. serrata given to the animals demonstrated no mortality as well as any adverse effect on animal health [67]. Boswellia is usually taken orally as a capsule, tablet, or decocation of its bark. The suggested dosage is based on current historical experience or studies. It is not currently known whether the appropriate dosage is for a balance between protection and effectiveness. The production of Boswellia products differs from one product to another and this makes standardization much more complicated. It is important to remember that most of the trials used different products manufactured by different suppliers, so clinical results could not be comparable [68,69]. In regard of the relatively low plasma and brain levels of BAs, and as a consequence of their inability to inhibit 5-LTX in whole blood, the abrogation of LTβ synthesis in vivo by frankincense extracts remains unclear. Several methods have been used to explore the potential pharmacological properties of various BAs to increase its bioavailability [70]. Some studies have endeavored to increase BAs' bioavailability using a regular meal. Furthermore, an improvement in their uptake was observed when it was administered with anionic drugs [71,72]. In addition, various approaches such as lecithin delivery process (Phytosome®): nanoparticle delivery mechanisms such as liposomes, emulsions, rigid lipid nanoparticles, nanostructured lipid carriers, micelles, and poly(lactic-co-glycolic acid) nanoparticles; and synthetic derivatization of BA have been modified to overcome this problem [73-75].

BRANDED FORMULATION CONTAINING BS
In addition to its use in religious ceremonies, olibanum has been used as an essential factive in perfumes, soaps, creams, lotions, and detergents, with an oriental emphasis in its aroma, in leading perfume and cosmetics products [76]. A third market for olibanum was developed by the interests of pharmaceutical firms. Some of the branded formulations containing B. serrata available in the market are as follows [77]:

1. In 1991, Boswellin®, a Sabinsa Company registered trademark, was introduced to the US and European markets. This is available in pills or tablets, as well as in a cream of salicylic acid that relieves calming discomfort. BA drugs range from 150 to 250 mgs/capsules and are taken orally 2–3 times a day. Shallaki®, contains 125 mg B. serrata in each capsule manufactured by Himalayan Drug Company, Makali, Bengaluru, as Licensed User of the Trade Mark owned by MMI Corporation, has excellent anti-inflammatory and analgesic properties, useful in relieving joint pains. Sixty capsule costs Rs. 75/- and the dose is 1 capsule twice daily (Batch No. F297001G).

2. Nilkanth® is a cream for external use in a 15 g container. It is a mixture of active herbal extracts (boswellin, arbutin, liquorice extract, and coriander seed oil in a cream base) developed by Dr. Reddy's Laboratories Limited, Hyderabad. It decreases the enzyme tyrosinase activity within the skin, thus reducing the development of melanin, leading to a decrease in the formation of dark skin.

3. Rheumatic-X® includes, in addition to a variety of ingredients, 20 mg “Shallaki” made by Sunrise Herbals, Varanasi (U.P., India), intended for rheumatoid, gouty, osteoarthritis, and sciatic pain, two capsules twice daily or as instructed by the physician.

4. Colorx® is a herbal capsule that blocks COX-2 and 5-LOX reducing inflammation, joint pain, and stiffness; 901 mg natural extracts; 120 veg. capsules; zero side effects; which is suitable for Jains, vegans, and vegetarians the capsule is registered by the Vegan Society – UK.

5. Frankincense® serrata an essential oil is steam obtained from a tree’s gum resin by plant therapy essential oil. It has been used by native peoples as an incense, medicine, and in cosmetics for thousands of years. It is used for a blend which helps to promote clear respiration and is used in other aroma therapies.
CONCLUSION
BA has gained widespread exposure for its various health advantages which mainly tend to work through anti-inflammatory mechanisms. They are also used as expectorant, antiseptic, and antineurotic drug. Alcohol extract from frankincense inhibit the growth of bacteria as well as fungi. Boswellia preparation like topical preparation inhibits 5-LO and prevents the formation of leukotrienes. There are various formulations which are used in the treatment of chronic disease like cancer. The net goal regarding the different constituents of BS is to understand the drug-drug interaction, molecular mechanism, and also strategies to improve their pharmacokinetic profile.

AUTHORS’ CONTRIBUTIONS
All the authors have contributed to the litenture review preparation, and editing of the manuscript.

CONFLICTS OF INTEREST
All authors have none to declare.

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