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## KATAN (*LINUM USITATISSIMUM* LINN.) A POTENT UNANI THERAPEUTIC AGENT FOR RESPIRATORY TRACT DISEASES

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**ABSTRACT:** Herbal medicines have attracted the researcher's attention nowadays as scientific evidence is coming regularly on their safety and efficacy. Katan (*Linum usitatissimum* Linn) is a potent therapeutic agent of Unani medicine for respiratory tract diseases since ancient times. Unani scholars have described Katan as having pharmacological effects, *i.e.*, Mohallil-e-Auram Munaffis-e-Balgham Mulattif Munzij, with its therapeutic uses in various respiratory tract diseases, *i.e.*, Nazla, Zukam, Sual Baghami, Warne Urooqe Khashina, Zeequnafs, and Dama. This literary research is an attempt to highlight the various researches carried out on Katan in many respiratory tract diseases so it can provide guidance to researchers in the coming days. From these studies it has been proved that Katan (*Linum usitatissimum*) is anti-inflammatory agent. Moreover, it also has an antibacterial, antiallergic effect and has a significant effect on COPD, asthma of childhood and adults. These findings prove the claims of the Unani medical scholars made centuries ago about the therapeutic effects of Katan in various respiratory tract diseases. Based on centuries-old experience of Unani scholars, we can find out solutions of many inflammatory respiratory tract diseases *i.e.*, Chronic Rhinosinusitis, Allergic Rhinitis, COPD, Bronchial Asthma, Bronchitis, *etc.* with the scientifically proved safe Unani drugs like Katan or its various classical formulations through collaborative multicentric 3<sup>rd</sup> phase clinical studies.

**INTRODUCTION:** Herbal medicines have attracted the researcher's attention nowadays as scientific evidence is coming regularly on their safety and efficacy. So new terms for herbal medicines like phytotherapy, Phytomedicine, phytoneering and nutraceuticals, *etc.* are coming into the scientific world.

Chronic Rhinosinusitis a very commonly occurring disease; adversely affecting the health of the population world over, which has no definite treatment. A growing amount of scientific evidence suggests that herbal medicine may be helpful as an adjuvant treatment in rhinosinusitis<sup>1</sup>.

Katan is a potent therapeutic agent of Unani medicine for respiratory tract diseases since ancient times. Katan (*Linum usitatissimum* Linn.) is an annual or biennial herb of family Linaceae; it is unknown in a wild state, the origin is uncertain, 60-120 cm high.<sup>2</sup> In Arabic it is known as Bazarul-katan<sup>2,3</sup>, Bazrul Kattana<sup>4</sup>, Kattan<sup>5</sup> and in English it is called Linseed, Blaobows and Common Flax<sup>3</sup>.

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In Chinese it is known as Ya Mazi<sup>5</sup>. In Persian it is called Tukhme Katan, Bazrak<sup>6</sup>, Zaghu<sup>2,3</sup>, Tukhm Mizaghira, Roghani Zaghira<sup>4</sup>. In Sanskrit it is known as Atasi<sup>7</sup>, Uma<sup>3,4,5,8</sup>. In Unani it is called Leefartas, Katan, Bazre Katan, Tukhme Katan<sup>6</sup> and in Urdu it is called Alsī<sup>4</sup>. Unani system of Medicine is based on four Humoral (Akhlat) theory postulated by Hippocrat. Four Akhlat are, *i.e.*, Dam (Blood), Balgham (Phlegm), Safra (Bile), Sauda (Black bile). A proper balance of Akhlat (Humors) within the body ensures efficient metabolism, prevents the build-up of toxins, and maintains health. Humoral imbalance is often the root cause of developing a particular disease with or without coexisting external factors. In the Unani system of medicine there are four principal modes of treatment. These are;

1. Ilaj Bil Tadbeer (Regimental therapy)
2. Ilaj Bil Ghiza (Dietotherapy)
3. Ilaj Bil Dawa (Pharmacotherapy)
4. Ilaj Bil Yad (Surgery)

This literary research is an attempt to highlight the various aspects of the pharmacology of Katan and its therapeutic indications described by eminent Unani scholars in the light of various recent researches carried out on respiratory tract diseases. The ultimate goal is to prove the relevance of the centuries-old claims of Unani Medicine with an aim to find out solutions to many inflammatory respiratory tract diseases *i.e.*, Chronic Rhinosinusitis, Allergic Rhinitis, COPD, Bronchial Asthma, and Bronchitis, *etc.* with the proven safe Unani drugs like Katan through collaborative multicentric 3<sup>rd</sup> phase clinical studies with modern researchers.

**History:** Flax is a native to Egypt<sup>4</sup>. It has been cultivated since at least 5000 BC, probably first by Mesopotamians and later by Egyptians who wrapped mummies in cloth made from it. Katan has been described by Unani Physician Descoroids (40-90 AD) in De Materia Medica<sup>9</sup>. It is a potent drug for respiratory tract diseases as Sina (1030 AD)<sup>10</sup>, Khan (1872)<sup>11</sup> and Jurjani (1878 AD)<sup>12</sup> described it under Adviyae Sadriya for the treatment of respiratory tract diseases.

**Katan (*Linum usitatissimum*) in View of Unani System of Medicine:** Keeping in mind the long history of the therapeutic use of Katan in Unani

Medicine especially in diseases of the respiratory tract, its medicinal profile described by Unani scholar is placed for review in the background of the present medicinal researches on flaxseeds in this particular field.



FIG. 1: FLOWERING PLANT OF *LINUM USITATISSIMUM*



FIG. 2: TUKHM-E- KATAN (SEEDS OF LINUM)

**Flowering Plant of *Linum usitatissimum* Tukhm-e- Katan (Seeds of Linum):**

**Mizaj:** Hot<sup>10</sup> & Dry Moatadil<sup>13,14</sup>, Hot & Dry 1015 with ratoobatfuzlia<sup>8,16,17,18</sup>, Hot 20 Dry<sup>20,19</sup>.

**Dose:** 5 Masha-1Tola<sup>15,20,6</sup> Masha-1Tola 16, 5 gm-7 gm 19, 5-20 gms 21, 10 ½ Masha<sup>18</sup>. Two tablespoons of ground flaxseed are recommended doses. According to the European Scientific Cooperative on Phytotherapy (ESCOP), the usual dose of flaxseed for constipation is 5gm of the whole, cracked, or freshly crushed seeds soaked in water and taken with a glassful of liquid 3 times a day<sup>22</sup>.

Part in use: Seeds (Tukhm), oil of seeds (Roughen), and Loab (mucilage) of the seeds<sup>15</sup>.

**Afaal (Pharmacological Actions):**

**1. Local Use:** Jali (Detergent)<sup>13,16,17,18,20,23</sup>, Mujaffif-e-Qurooh (Desiccant)<sup>8,17,18</sup>.

**2. Systemic Use:** Mohallil-e-Auram (Resolvent) <sup>2, 6, 15, 16, 19, 20, 21, 23, 24, 25</sup>, Mukhrije Balgham / Munaffis-e-Balgham (Expectorant) <sup>2, 6, 8, 15, 16, 17, 19, 21, 26</sup>, Mulattif (Demulcent) <sup>2, 8, 14, 16, 18, 20, 27</sup>, Munzjij (Coctive) <sup>14, 16, 19, 25, 26</sup>, Naffakh (Flatulent) <sup>6, 13, 14, 15, 20</sup>, Mullaiyen (Laxative) <sup>15, 18, 19, 20, 23, 26, 28</sup>, Qabiz (Astringent) <sup>6, 13, 14, 23</sup> after Biryani (roasting) <sup>2</sup>. Besides this it has been described as having more actions like Moharrik -e-Bah /Mubahi (Sex stimulant) <sup>6</sup>, Muqawwi-e-Bah (Aphrodisiac) <sup>13, 14, 16, 18, 23, 25</sup>, Mughalliz-e-Mani (Inspirant to semen) <sup>17, 18</sup>, Muzaiyyade Mani (Increase in Semen Volume) <sup>6</sup>, Moarriq (Increased Sweating) <sup>16, 18, 23</sup>, Mudir Baul /Mudir Khafeef (Mild Diuretic) <sup>14, 15, 16, 17, 18, 21, 23, 25, 26</sup>, Mufatitt-e-Hasat Kuliya WA Masana (Renal and Cystic lithotriptic) <sup>17, 18, 23</sup>, Muqi (Emetic) <sup>20, 21</sup>, Mudir-e Haiz (Emmenagogue) <sup>14, 15, 17, 20, 23</sup>, Musqit Janeen (Abortifeciant) <sup>18</sup>, Mufriz-e-Laban (Galactagogue) <sup>16, 18, 23, 28</sup>, Musakkine Auja (Analgesic) <sup>11, 14, 17, 19, 20, 21, 28, 29, 30, 31</sup>.

**3. Ethenobotanical:** Emollient <sup>4, 20, 29, 30, 32</sup>, Suppurative <sup>32</sup>.

### Mawaqeistemal / Therapeutic Uses:

**1. Local use:** Auram (Local inflammation) <sup>8, 15, 14, 18, 19, 26</sup>, Auram-e-Harra (Acute Inflammation) <sup>14, 17, 18, 19, 26</sup>, Jhain / Kalaf <sup>6, 13, 14, 15, 17, 18, 26</sup>, Mohase (Pimples) <sup>6, 18</sup>, Muqashshar Nakhoon <sup>6, 13, 14, 18</sup>, Namla <sup>15, 18, 20</sup>, Busoor (Pustules) <sup>14</sup>, Busoor-e-Labniya <sup>14, 15, 17, 18, 26</sup>, Ganj (Baldness) <sup>18</sup>, Phunsi / Phore (Boil/Abscesses) <sup>2, 6, 8, 18, 26</sup>, Warne Sulb (Hard Swelling) <sup>6</sup>.

**2. Systemic uses:** Nazla (Nasal catarrh) <sup>8</sup>, Zukam (Post Nasal Catarrh) <sup>13, 14, 18</sup>, Zukam Har <sup>18</sup>, Sozish-e-Halaq (Sore Throat) <sup>15, 18, 26</sup>, Sual Baghami (Productive Cough) To be taken with honey <sup>2, 6, 13, 14, 15, 16, 17, 18, 19, 23, 25, 26, 29, 33</sup>, Warne Urooge Khashina (Bronchiolar swelling) <sup>8, 15, 17, 26</sup>, Zatuljanb (Pleuritis) <sup>2, 14, 15, 17, 18, 26, 29</sup>, Zaturriya (Pneumonia) <sup>2, 6, 8, 14, 15, 17, 18, 21, 26</sup>, Zeequnafs (Breathlessness) <sup>8, 15, 19, 21, 26</sup>, Dama (Asthma) <sup>21</sup>.

**3. Ethenobotanical:** Cold <sup>2, 3, 33</sup> (to be taken with honey) <sup>3, 5, 12, 16, 31, 33</sup>, Catarrh <sup>31</sup>, Bronchitis <sup>3, 4, 31, 32</sup>, Bronchopneumonia <sup>3</sup>.

Besides above Katan has been recommended in other diseases *i.e.* Bawaseer (Haemorrhoids) <sup>6</sup>, Hasat-e-Kuliya WA Masana (Renal and Bladder

Calculi) <sup>16, 18</sup>, Iltehab Baretton/Sifaaq (Peritonitis) <sup>8, 18</sup>, Irqun Nisa (Sciatica) <sup>17, 18</sup>, Niqras (Gout) <sup>2, 8, 17, 18, 26</sup>, Qabz (Constipation) <sup>2, 18, 20</sup>, Qooba (Ring Worm) <sup>17, 18</sup>, Qurooh -e-Shahadiya <sup>6, 15, 18, 26</sup>, Qurooh-e-Ama (Intestinal Ulcer) <sup>6, 14, 18</sup>, Qurooh-e-Kuliya (Renal Ulcer) <sup>6, 14, 16, 18, 23</sup>, Qurooh-e-Masana (Cystic Ulcer) <sup>3, 6, 14, 16, 18</sup>, Qurooh-e-Reham (Uterine Ulcer) <sup>6, 13, 18</sup>, Shiqaaq-e-Maaqad (Anal Fissure) <sup>18</sup>, Suda-e Har <sup>6</sup>, Suda-e Warmi <sup>16, 23</sup>, Surkhie Chashm (Conjunctival redness) <sup>23</sup>, Suzak (Gonorrhoea) <sup>2, 15, 18, 26</sup>, Wajaul Ain (Ophthalmic Pain) <sup>16, 23</sup>, Wajaul Ama (Colic) <sup>2, 14, 16, 18, 23</sup>, Wajaul Mafasil (Arthralgia) <sup>17, 18, 21, 23</sup>, Warne Baretton (Peritonitis) <sup>5, 15</sup>, Warne Kabid (Hepatic swelling) <sup>8, 16, 18, 23</sup>, Warne Mafasil (Joint swelling) <sup>2, 8, 14, 15, 17, 26</sup>, Warne Reham (Uterine Swelling), Warne Sulb (Hard Swelling) <sup>6</sup>, Warne Tehal (Spleen swelling) <sup>8, 16, 18</sup>, Zaufe Bah (Sexual Weakness) <sup>16, 18</sup>.

**3. Ethnobotanical:** Carbuncle <sup>4, 30</sup>, Burns & Scalds <sup>2, 3, 30, 33</sup>, Sprains <sup>33</sup>, Skin inflammation <sup>34</sup>, Conjunctivitis (Infusion and decoction of seed is used) <sup>2</sup>, Irritable Conjunctiva <sup>2, 4</sup>, Ulcer <sup>2, 30</sup>, Atherosclerosis <sup>3, 34</sup>, Colitis <sup>3, 32</sup>, Cystitis <sup>2, 3, 4</sup>, Diarrhoea Dysentery <sup>2, 3, 4, 32</sup>, Diverticulitis <sup>34</sup>, Genitourinary diseases <sup>27</sup>, Hypercholesterolemia <sup>32</sup>, Hysteria- smoke is taken <sup>3, 3</sup>, Irritable Bowel Syndrome <sup>34</sup>, Kidney disease <sup>27</sup>, Pelvic Cellulitis <sup>3</sup>, Pericarditis <sup>3, 4</sup>, Quinsy <sup>3</sup>, Rheumatic Swelling <sup>2, 27, 31</sup>, Strangury <sup>4</sup>, Urinary Tract affections <sup>2, 30, 32, 33</sup>.

**Muzir (Adverse Effects):** It delays digestion time, delays transfer of food from the stomach to intestines, so not good for the stomach, less Hemopoetic / nutritious <sup>13, 14</sup>. It disturbs vision, and it becomes hazy, harmful for khusya (Testicles) <sup>18</sup>. It weakens digestion/flatulent <sup>15, 16, 26</sup>, powers, disturbs vision <sup>16</sup>. It causes sexual weakness <sup>2, 27</sup>, visual weakness, not good for stomach <sup>5</sup>. It is harmful to vision <sup>5</sup> for digestion, testicles <sup>25</sup>. Musleh (Correctives): Sikanjbeen <sup>6, 15, 16, 20, 25</sup>, Shahad <sup>15, 16, 20, 23, 25</sup>, Kishneez <sup>6, 17, 19, 21, 25, 28, 26</sup>. For delayed digestion time, delayed transfer of food from the stomach to intestines, bad effect on stomach, less Hemopoetic action and for disturbed vision, Anar (Pomegranate) and Shahad (Honey) are recommended.

For the prevention of weak digestion, Sikanjbeen is recommended. For the prevention of bad effects on testicles, Honey and Gulqandare prescribed. For



hazy vision, Kishneezis recommended<sup>18</sup>. Badal (Substitute): Hulba/Methi<sup>21, 16, 18, 25</sup>, Usarae Baqla<sup>25</sup>. Murakkabat (Compound formulations): Laooqe-Katan<sup>28</sup>, Marham Dakhiliyoon<sup>15</sup>, QairootiBazare Katan<sup>2</sup>,

**Chemical Constituents:** Dried ripe seeds contain 30-40% of fixed oil, 23-34% Protein, and 5% of mucilage<sup>22</sup>. The Indian linseed has moisture 06%, Protein 20.3%, Fatty Oil 37.1%, and Carbohydrate 28.8%. Carbohydrates are sucrose, raffinose, cellulose, and mucilage<sup>32</sup>. It provides 1 gram carbohydrate per 100 g, Fibre 4.8%, Minerals 2.4% like calcium, Phosphorus and Iron, Vitamins *i.e.*, Thiamine, riboflavin, niacin, pantothenic acid, E, A( $\beta$ -carotene), and enzymes Linase. It also contains resins, wax, and lecithin.

Linseed (*Linum utissimum*) contains numerous beneficial components, including alpha-linolenic acid (ALA), Cyanogenic glycosides (linamarin, linustatin, neolinustin), Unsaturated fatty acids (linolenic acid, linoleic acid, oleic acid, stearic acid, malic acids), Soluble flaxseed fibre mucilage (D-xylose, L-galactose, L-rhamnose, d-galacturonic acid), Lignans {secoisolaricresinoldiglycoside (SDG)}, Monoglycerides, triglycerides, free sterols, sterol esters, hydrocarbons (protein), phenylpropane derivatives<sup>35</sup>. Flaxseeds contain about 42% oil, very little of the fat is saturated. More than 70% of the fat (Alpha Linolenic Acid) in flaxseed is of the healthy polyunsaturated type. Other chief fatty acids are Linoleic Acid (10-25%), Oleic Acid (13-30%)<sup>21</sup>.

Saturated acids are myristic, stearic and palmitic (5-11%)<sup>31</sup>. A unique feature of the polyunsaturated fats in flaxseed is the high ratio of alpha-linolenic acid (an omega-3 fat) to linoleic (an omega-6 fat)<sup>35</sup>. The risk of toxicity from flaxseed consumption due to cyanogenic glycosides and cadmium appears negligible for most individuals when flaxseed products are consumed in moderation. The level of vitamin B antagonist-linatin in flaxseed has never been associated with toxicity in humans<sup>36</sup>.

**Toxicity:** It causes diarrhoea, gas, nausea<sup>34</sup>. Overdose symptoms of flaxseeds are increased respiratory rate, excitement, gasping, staggering, weakness, paralysis, and convulsion<sup>33</sup>.

**Precautions:** Don't use immature flaxseeds as these are poisonous<sup>33</sup>. Do not use flaxseeds in

pregnant and lactating mothers, prostate cancer patients<sup>34</sup>.

**Contraindication:** Flaxseed is contraindicated in the following conditions; Ileus, stricture of esophagus and GIT, acute inflammation of esophagus, stomach opening and intestine<sup>21</sup>.

**Pharmacological/Clinical Studies:**

**Nutritional Studies:** In a study, it showed that roasting effectively reduces the anti nutritional factors like cyanogenic glycosides contents of flaxseeds<sup>37</sup>.

**Bioavailability of Ala and Other Contents:** Ingesting flaxseed can provide ALA to the circulation and tissues of the body, and its levels are increased as early as two weeks after the initiation of flaxseed supplementation<sup>38</sup>. Ingestion of flaxseed oil provides greater bioavailability of ALA than from milled seed and has greater bioavailability ALA from milled seed than ingestion of whole seed<sup>39</sup>. Crushing and milling of flaxseed substantially improve the bio-availability of enterolignans<sup>40</sup>.

**Antibacterial Effect:** Hydrolysed Linseeds oil has potentially useful antibacterial properties as a topical preparation against *Staphylococcus aureus* strains resistant to antibiotics<sup>32</sup>. In an antibacterial study of Flax seeds proteins, it was revealed that it has an inhibitory effect on *Escheria coli*, *Salmonella* spp, and *Klebsiella* spp, *Enterococcus faecalis*<sup>41</sup>.

In an animal study, it was observed that long-term flaxseed supplementation protected the mice against bacterial colonization of lungs with *Streptococcus pneumonia* with reduced histopathological involvement of lung tissue. The difference in the levels of pro-inflammatory (TNF- $\alpha$  and IL-1 $\beta$ ) and anti-inflammatory (IL-10) cytokines were observed in the flaxseed fed animals<sup>42</sup>.

In an antimicrobial study of Flax seeds, total protein extract was examined against several microorganisms using the microbial micro-plate dilution method; the result showed that flaxseed proteins have an inhibitory activity on bacteria especially against *Enterococcus faecalis*, *Salmonella typhimurium* and *Escherichia coli*<sup>38</sup>.

**Anti-inflammatory effect:** In an *in-vitro* study, n-3 Fatty Acids and Lignans of Flex seeds have shown significant anti-inflammatory and antioxidant effects in Acute Lung injury<sup>43</sup>.

In an animal study, it was demonstrated that Flaxseed supplementation has significantly reduced lesional area of skin test response of atopic horse, reduce inflammation and alter the fatty acid profile of hair<sup>44</sup>. In a clinical study it was found that flaxseed oil given at 14g/day to human subjects over 4 weeks decreased the level of tumour necrosis factor- $\alpha$  (TNF- $\alpha$ ), interleukin-6 (IL-6) and cytokines<sup>36</sup>.

Five randomized controlled trials show that n-3 PUFA supplementation during pregnancy reduced the 12-month prevalence of positive egg SPT (two trials, 12/87 versus 32/100, OR 0.33, 95% CI 0.16, 0.70) and childhood asthma (two trials, 10/303 versus 17/179, OR 0.349, 95% CI 0.154, 0.788) and significantly reduced cord blood interleukin-13 levels (anti-inflammatory marker)<sup>45</sup>.

Lipid profile in hypercholesteremic patients with unroasted Flaxseeds incorporated was not significant in comparison to the significant effect of roasted Flaxseeds<sup>46</sup>.

**Antiallergic Effect:** Role of dietary long-chain polyunsaturated fatty acid (PUFAs) consumption during pregnancy and early childhood and its influence on allergy and respiratory diseases as the long-chain polyunsaturated fatty acids have been reported to have immunomodulatory effects<sup>47</sup>.

**Anti-COPD Effect:** Epidemiological and observational studies strongly supported the efficacy of omega-3 fatty acids in the prevention or amelioration of asthma and allergic diseases. Molecular mechanisms have been revealed in part by the identification of fatty acid bioactive metabolites; generated *via* lipoxygenase and cyclooxygenase. The specialized pro-resolving mediators (SPM) possess anti-inflammatory properties, offering a more precise understanding of these benefits in inflammatory responses<sup>48</sup>.

A newly identified group of lipid mediators produced from the oxidation of n-3 fatty acids (EPA and DHA) include Rv and PD, which have also been suggested as key players in the resolution of inflammation. Reduced inflammation attenuates

the severity of asthma, including symptoms (dyspnoea), and thereby exerts a bronchodilatory effect. The n-3 fatty acid intervention studies on asthmatics have shown that there is a possible beneficial role of n-3 on asthma as well as EIB<sup>49</sup>.

A cross-sectional study of 642 subjects was conducted to determine the association between seafood intake, serum PUFA composition, and clinical endpoints of asthma in adults. The study used the European Committee Respiratory Health Survey (ECRHS) questionnaire, skin prick tests, spirometry, and methacholine challenge tests following ATS guidelines. The study demonstrated that n-3 fatty acids (EPA and DPA) are associated with decreased NSBH risk, while certain n-6 fatty acids (LA, DGLA, and AA) are associated with an increased risk of NSBH<sup>50</sup>.

A randomized controlled clinical study on 60 patients of COPD, equally distributed in Test and control groups, was carried out. In Test group a Pharmacopeial Unani formulation "Lauq Katan" (Linctus of *Linum usitatissimum* L. mucilage) was given in a dose of 10 gm thrice daily and in control group Theophylline 200 mg was given thrice daily for 6 weeks. On the basis of spirometry parameters FEV1 and FEV1/FVC; it was observed that the test drug Lauq Katan had a significant effect in the management of COPD<sup>51</sup>.

**Chronic Rhinosinusitis:** In a single-blind, randomized, controlled clinical trial of 6 weeks duration on 40 CRS patients, an Unani formulation composed of Katan (*Linum usitatissimum*), Filfil Siyah (*Piper nigrum*) and Honey was given 6gm BD with inhalation of Kalonji (*Nigella sativa*) in Test drug group (20 patients).

The test drug has a statistically highly significant effect on most of the major and minor symptoms of CRS. In the control group (20 patients) of patients receiving Tab Alaspan 10D with inhalation of Karvol Plus capsule inhalation. The control drug has a statistically significant effect on most of the major and minor symptoms of CRS<sup>52</sup>.

**DISCUSSION:** From history, it is evident that Katan is in medicinal use since ancient times by traditional medicine like Unani, Ayurvedic, Persian, and Chinese medicine, *etc.* In Unani Medicine, Katan has been placed under the

category of Adviyasadiya (respiratory medicine). Its use as a single drug or as an ingredient of compound formulation as Lauq Katan from its mucilage and also from its seeds are recommended for treatment of NazlaBarid/Muzmin, Zeequnafs<sup>28</sup>.

From the above studies, it is proved that Katan (*Linum usitatissimum*) is a potent anti-inflammatory agent. Moreover, it also has antibacterial, antiallergic effect and has a significant effect in COPD, especially in asthma of childhood and adults, Chronic Rhinosinusitis. Roasting of flaxseeds increases its nutritional value and its medicinal efficacy, which is the age-old practice of Unani medical practitioners. The recommended dose of 5-10 gms in UM has been approved by ESCOP.

The scientific evidence approves the claims of Unani scholars about the Katan having pharmacological effects *i.e.* mohallil-e-auram (Resolvent), mukhrije / munaffis-e-balgham (Expectorant), mulattif (Demulcent), munzij (Coctive) and its therapeutic uses in various diseases of the respiratory tract, *i.e.*, Nazla (Nasal catarrh), Zukam (Post Nasal Catarrh), Zukam-e- Har, Sozish-e-Halaq (Sore Throat), Sual Baghami (Productive cough) to be taken with honey, Warne Urooqe Khashina (Bronchiolar swelling), Zatuljanb (Pleuritis), Zaturriya (Pneumonia), Dama (Asthma), Zeequnafs (Breathlessness). Besides these effects, Flax seeds have shown health benefits including decreasing rate of tumor growth, reducing serum cholesterol level, decreasing risk of cardiovascular disease and cancer, particularly of the mammary, prostate gland, and colon, laxative effect, and alleviation of menopausal symptoms and osteoporosis. Some clinical studies revealed that n-3 polyunsaturated fatty acids are helpful in the prevention of coronary heart diseases, atherosclerosis, rheumatoid arthritis, and asthma<sup>53</sup>. There is a need to initiate collaborative research studies on the basis of Unani pathological theories of various diseases and take up clinical trials on various formulations described by scholars of Unani medicines in classical literature to find out the solution of inflammatory respiratory diseases like Chronic Rhinosinusitis, Allergic Rhinitis, COPD (Bronchial Asthma), Bronchitis, *etc.* with the scientifically proven anti-inflammatory, safe herbal drugs.

On the basis of the centuries-old experience of Unani scholars, we can find out solutions for many inflammatory respiratory tract diseases, *i.e.*, Chronic Rhinosinusitis, Allergic Rhinitis, COPD, Bronchial Asthma, Bronchitis, *etc.*

We can take the initiative to consider the multicentric III phase studies on the basis of findings of published PG clinical studies of Unani scholars and can find out the solution of various respiratory diseases as mentioned above with safe, efficient, economic Unani Medicines like Katan (Flaxseeds) or its various classical formulations.

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