



DARUNAJ AQRABI (DORONICUM HOOKERI HOOK F.): POTENTIAL MEDICINAL RHIZOME OF UNANI MEDICINE-A REVIEW

Mohammad Avid¹, Riyaz Ahmad², Mohd Afsahul Kalam^{3*}, Faheem Akhtar⁴, Wasim Ahmad⁵

^{1,2}PG Scholar Department of Ilmul Advia, Regional Research Institute of Unani Medicine, Kashmir University, Srinagar-190006 J&K- India

³Associate Professor, Department of Ilmul Advia Regional Research Institute of Unani Medicine, Kashmir University, Srinagar-190006 J&K- India

⁴PG Scholar Department of Moalajat, Regional Research Institute of Unani Medicine, Kashmir University, Srinagar-190006 J&K- India

⁵Assistant professor, Department of Ilmul Advia (Pharmacology Unani), Mohammadia Tibia College & Assayer Hospital Mansoor, Malegaon, Nasik India.

Abstract:

Darunaj Aqrabi is Potential medicinal rhizome of Unani Medicine which is obtained from *Doronicum hookeri* of Asteraceae family. It is used for the treatment of various diseases like palpitation, hemiplegia, nightmare, flatulence etc. It is also used as antidote in scorpion bite and snake bite. There are limited pharmacological studies like, Antimicrobial, antioxidant, hepatoprotective, have been evaluated which are attributed due to the chemical constituents present in the rhizome, but more studies required. This review provides detail about its identification therapeutic uses. It is hoped that it will be helpful to the research community for further studies.

Keywords: *Darunaj Aqrabi*, *Doronicum hookeri*, Rhizome, Cardio tonic, Antidote.

Introduction:

Unani Medicine also called Greco-Arab medicine, is an ancient system of medicines based on the concept of humoral theory of Hippocrates (460-377 BC), using natural methods of treatment like, dietotherapy, Regimenal therapy and pharmacotherapy. In pharmacotherapy several natural compounds from plants, animals and mineral sources are used. Most of the drugs are used from plants. Various parts of the plants like, root, rhizomes, barks, wood etc. are used for medicinal purposes. *Darunaj Aqrabi* is one of the most utilized rhizomes of Unani medicine which is brownish externally and white (like Alabaster) internally, heavy in weight and hard in consistency. (Ghani HN 2010) *Darunaj Aqrabi* is a rhizome obtained from *Doronicum hookeri* commonly known as “Leopard’s bane”, it named so because it kills leopard. The Arabic name *Darunaj Aqrabi* is derived from two words, *Darunaj* which means nodular and *Aqrabi* means scorpion like, since it resembles the scorpion's tail in morphology. (Khare CP 2007; Ibn Sina 2010; Khan A 2013; Hooper D 1931) It is useful in nervous depression and is prescribed for scorpions and insects bite. (Hooper D; 1931) Greek writers referred to the species *Doronicum* as *Aconitum pardalianches*, and Ibn Sina (c. 980 –1037) probably introduced the plant into western culture. (Ines AF 2003) Rhizomes of *Doronicum roylei* DC. (native to Punjab), *Doronicum falconeri* Hook. f. (native to North Western Himalayas) and the European species i.e. *Doronicum pardalianches* Linn. And *Doronicum scorpioides* are introduced into India and are also classified as *Darunaj Aqrabi*. (Khare CP 2007; Khare CP 2016; Ghani HN 2010) It has a finger-thick consistency, (Ibn Baytar 2000; Khan A 2013). The taste of rhizome is starchy, astringent, bitter and acidic flavour; odour present but not specific. (Kabiruddin M 2014; Khan A 2013) *Darunaj Aqrabi* has two variations, Roman and Persian, according to classical Unani texts. Roman variety rhizomes are of good quality, particularly those that are bitter, hard and white inside. (Ghani HN 2010; Khan A 2013) The rhizome is used for various medicinal purposes. Ibn Sina has mentioned it as effective drug used in cardiac diseases. (Naseer M 2016) Some people used to hang on their doors to prevent from epidemic diseases like plague. Some people put it over head to prevent from unwanted dreams. (Khan A 2013) Pregnant women wear it around the waist to protect foetus and procuring painless delivery. It is being hung up over the bed to prevent night terrors and endures pleasant dreams. (Hakim MA 2015; Khan A 2013) According to various studies performed, it has shown to possess antibacterial, antifungal hepatoprotective, and antioxidant activities. (Kumar VP 2006; Syed S 2014; Gupta D 2011) This review includes pharmacological action, therapeutic uses, temperament, adverse effect, corrective measures and other information related to *Darunaj Aqrabi* with reference to Unani Medicine and recent scientific studies.

Mutaradifat (Vernacular Names)

Arabic: *Aqir, Darunaj Aqrabi* (Hakim MA 2015; Ibn Baytar 2000; Khan A 2013)

Hindi: *Toos, Tarang* (Ibn Baytar 2000; Khan A 2013)

English: *Leopard's Bane* (Ibn Sina 2010)

Latin: *Durunicum* (Anonymous 2006)

Persian: *Darunak, Darunā* (Ibn Baytar 2000; Khan A 2013)

Suryani: *Qarufas* (Ibn Baytar 2000)

Hebrew: *Qarunus* (Ibn Baytar 2000; Kabiruddin M 2014; Aiman F 2021)

Distribution

It is the native to the foothills of Himalayas in India, Nepal, Bhutan and Sikkim, Tung, and Tibet between 12000-14000 feet. (Aiman F 2021; Khare CP 2007; Kumar VP 2006; Kalam MA 2019; Khan A 2013)

Botanical description

The plant of *Doronicum hookeri* is 0.3-0.6 m high. Rhizomes are fibrous, nodular, glabrous or glabrate and might be woody or fleshy, hard, heavy in weight and externally brown or greyish and internally white in colour; Fresh, fleshy rhizomes are fragile and succulent, but woody rhizomes are fibrous and stiff. (Aiman F 2021; Ines AF 2003) The stem is green when fresh, and pale yellow to brown in dry condition and fistulose, cylindrical, and somewhat ribbed, standing upright, 10 to 85 cm tall. (Ines AF 2003; Ghani HN 2010; Aiman F 2021; Khan A 2013) Leaves are simple, alternating originate from stem in a dissimilar way. (Khan A 2013) The top cauline leaves are reduced, sessile, and oblong to bract-like, while the basal leaves are petiolate. radical leaves, or soon withering; cauline 10-15 by 2.5-5 cm., often unequal sided, leaves all narrowed into short, alternate, petiolate 1/2-amplexicaul petioles (petiole bases sometimes dilated, clasping), oblong or elliptic lanceolate, obtuse or acute, margins entire or irregularly toothed; blades palmati-pinnately. (Aiman F 2021) Attenuate, decurrent on the stem, denticulate edge to severely serrated and acute apex describe the characteristics of the leaf base. (Ines AF 2003; Yilin C 2011; Kirtikar K 2012) It has two to seven radiating, hemispheric to broadly campanulate, homochromous capitula with yellow or green-yellow corollas. The size of the capitulum is between 15 and 20 mm. Ray florets are golden and range in length from 2.3 to 4.5 mm. In some species, phyllaries are herbaceous to slightly papery at the base, sparsely distributed in 2 or 3 rows, arachnoid, and acuminate at the apex. The disc florets are yellow, funnel-shaped, 4-4.5 mm, sparingly glandular-lobbed (Yilin C 2011) with long-peduncle heads, the flowers are yellow. Fruits are short-pappus achene (Pullaiah T 2006; Ghani HN 2010)



Fig. Showing Rhizomes of Darunaj Aqrabi (*Dorronicum hookeri*)

Scientific classification

Kingdom: Plantae

Division: Pteridophyta

Class: Pteridopsidag

Order: Polypodiales

Family: Polypodiaceae

Genus: Polypodium

Species: *P. Vulgare* (Aiman F 2021)

Mizāj (Temperament)

The temperament is hot and dry in 3rd degree (Ibn Baytar 2000; Ibn Sina 2010; Ghani HN 2010; Kabiruddin M 2010; Hakim MA 2015)

Af'āl (Action)

It possesses *Muḥallil* (resolvent), *Musakhkhin* (calorific), *Hādim* (digestive), *Kāsir-ī-reyāh* (carminative), *Muhāfiz-ī-Janīn* (Protective of foetus), *Mufarriḥ Qalb* (exhilarant), *Muqawwi-ī-Qalb* (cardio tonic), *Muqawwi-ī-Mi'da* (stomachic), *Muqawwi-ī-Jigar* (liver tonic), *Mufattit-i-Sang-i-Gurda*, *Mufattit-i-Sang-i-Mathāna* (lithotriptic), *Tiryāq-i-Samum* (antidote) properties. (Ibn Baytar 2000; Kabiruddin M 2010; Ibn Sina 2010; Kabiruddin M 2014; Hakim MA 2015; Ghani M, 2010)

Iste'mālāt (Uses)

It is used for the treatment of *Du'f-i-Qalb*, *Khafaqān Bārid* (palpitation due to cold), *Fālij* (hemiplegia), *Laqwā* (bell's palsy), *Badkhwābi* (night mare), *Mālikhūliyā* (melancholia) *Nafakh-ī-Shikam* (flatulence), *Waja al-Mi'da* (abdominal pain), *Qabḍ* (constipation), *Waja' al-Zahr* (low backache), *Dawār* (vertigo), *Hasāh al-Mathāna*, *Hasāh al-Kulya* (Renal and bladder stone) *Waja' Al-Raḥim Rīhī* (uterine pain due to accumulation of gasses), *Waram-i-Rahim* (metritis), *'Irq al-Nasā* (sciatica), *Tā'un* (plague) and useful in snake and scorpion bite. (Kabiruddin M 2014; Kabiruddin M 2010; Ibn Sina 2010; Khan A 2013; Hakim MA 2015) It helps to maintain pregnancy and reduces pain during labour. (Ghani HN 2010)

Tarkīb-i-Iste'māl (Method of administration)**Amraḍ -i-Nafsāniya (Psychological disorders)**

- The root is used to prevent giddiness on ascending heights. (Ghani HN 2010; Ibn Baytar 1999; Kabiruddin M 2010)

Amraḍ-i-Qalb wa Ri'a (Cardiac and lung diseases)

- It is useful in chest pain when taken with honey. (Khan A 2013)

Poisonous bites:

- It's used orally with fig as antidote when bitten by poisonous insects and also used in plague. (Ibn Baytar 2000; Kabiruddin M 2014; Nabi MG 2007; Khan A 2013)

Maḍarrat (Side effects/Adverse effect/Contra indication)

It causes headache and is harmful particularly for the person having hot temperament (Nasir M 1884; Khan A 2013; Hakim MA 2015; Ghani HN 2010, Ibn Baytar 1999; Kabiruddin M 2010)

Muṣliḥ (Correctives)

Its adverse effects are countered by the use of *Bādiyān* (*Foeniculum vulgare* Mill.) and *Nashāshṭā* (carbohydrates) (Nasir M 1884; Ibn Sina 2010; Hakim MA 2015)

Badal (Substitute)

Zarambād (*Curcuma zedoaria*), *Qaranful* (*Syzygium aromaticum*), (Ibn Sina 2010) *Suranjan* (*Colichicum luteum*) and *Aqir Qerha* (*Anacyclus pyrethrum* DC.) are used as substitute, if *Darunaj Aqrabi* is not available (Nasir M 1884; Ghani HN 2010; Hakim MA 2015; Ibn Baytar 1999; Kabiruddin M 2010)

Miqdar-i-Khurak (Dose):

Its therapeutic dose is mentioned as about 7.0 g (Nasir M 1884); 4-7gm (Hakim MA 2015; Ghani HN 2010; Ibn Baytar 1999; Kabiruddin M 2014)

Murakkabat (Compound formulations)

Buzurg Dāru, Dawa al-Misk, LabubKabir, Mā'jun Alvi Khān, Mā'jun Ḥamal Ambari Alvi Khān and Mufarriḥ Yaqūtī. The details about the compound formulations can be seen in Table 01. (Ibn Sina 2010; Kabiruddin M 2014)

Table 01: Showing name of compound formulations, dose and modes of administration with indication

S.No.	Name of compounds	Dose and mode of administration	Indication
01	<i>Dawaul Misk Mo'tadil</i> (Kabiruddin M 2010; Arzani A 2009)	It is taken in quantity of 5 to 10 g with water at bedtime.	Vital organs insufficiency, palpitation, melancholia, neuropsychosis.
02	<i>Dawaul-Misk Har Sada</i> (Kabiruddin M 2010; Arzani A 2009)	5 g with 84 ml of <i>Arq Bādiyān</i> in morning.	Palpitation, Melancholia, Psychosis, diseases which occur due to excess of phlegm and black bile, epilepsy, facial palsy.
03	<i>Mā'jun Hafizul Janin /Mā'jun Hamal Ambari Alvi Khā</i> (Hafeez A 2005; Anonymous 1986)	5 g with milk before breakfast	Useful in threatened miscarriages, excess bleeding after delivery or for women whose offspring's die at birth.
04	<i>Khamira Abresham Sada</i> (Anonymous 2009)	5-10 g with water twice a day after meal.	Palpitation, distress, weakness of Heart
05	<i>Mufarreh Azam</i> (Anonymous 1986)	5 g with water in the morning	Palpitation, cholera, Plague, sexual weakness.
06	<i>Safuf Darunaj</i> (Khan MS 2006)	4.5 g with honey	Palpitation due to cold, weakness of heart, cholera, plague etc.
07	<i>Khamira Murakkab</i> (Anonymous 1986)	5 g with milk before breakfast	Disease of the heart, weakness of heart, palpitation, disease of brain.
08	<i>Khamira Abresham Sāda</i> (Anonymous, 2009)	5-10 g. with water twice a day after meal.	Disease of the heart, weakness of heart, palpitation, disease of brain.
09	<i>Mā'jun Murawwehul Arwāh</i> (Hafeez A 2005)	1g twice a day	Weakness of heart, disease of liver, palpitation, cardio tonic, neuro tonic, liver tonic, stomachic.
10	<i>Mufarreh Azam</i>	5 g with water in the	Exhilarant relieves palpitation,

	(Anonymous 1986)	morning	aphrodisiac, plague.
11	<i>Arq-i-Ambar</i> (Anonymous 2016)	60 ml, taken orally along with <i>Sharbat-i-Anar</i>	General weakness, weakness of heart, weakness of the brain, weakness of the liver, fainting, Asthenia.
12	<i>Yaquti</i> (Khan MS 2006)	4.5 g with water in the morning	Palpitation, vertigo, weakness of heart
13	<i>Yaquti Hār</i> (Khan MS 2006)	1.75-3.5 g with water in the morning	Disease of the heart, kidney, palpitation, carminative.
14	<i>Mā'jun Istiqrar-i-Hamal</i> (Khan MS 2006)	1 g with water in the morning	To promote conception
15	<i>Mā'jun Hakim 'Alvi Khan</i> (Khan MS 2006)	4.5 g twice a day	Infantile convulsion and epilepsy
16	<i>Habb-i-Ambar Momiya'i</i> (Hafeez A 2005)	2 pills with cow milk at bedtime	Sexual weakness, spermatorrhoea, nocturnal emission, premature ejaculation. It strengthens vital organs, removes sexual debility and impotency.
17	<i>Mufarreh Shaikhur-Ra'is</i> (Kabiruddin M 2006)	3 g with water in the morning	Tubercular fever, melancholic fever, palpitation, vital tonic.
18	<i>Mufarreh Mo'tadil</i> (Arzani A 2009)	6 g with water in the morning	Disease of the heart, weakness of heart.
19	<i>Mufarreh Har</i> (Arzani A 2009)	9-12 g with water in the morning	Palpitation, cardiac weakness
20	<i>Labub-i-Kabir Khas</i> (Kabiruddin M 2010)	5 g with milk or water before breakfast	Sexual weakness, nerve weakness, cardiac weakness, renal weakness.

Bioactive compounds

Chemical constituents of *Doronicum hookeri* have not been investigated and characterized yet. Recently 5, 7, 4'-trihydroxy-6-methoxy-flavone-5-O- α -L-rhamno-pyranosyl-1 \rightarrow 4)-O- α -L-arabinopyranosyl-4'-O- β -D-glucopyranoside has been reported in methanolic extract of flowers of *Doronicum hookeri*. Flavonoids, alkaloids, saponins, cardiac glycosides, phenolic contents are isolated from the rhizomes. The other constituents present in *Doronicum pardalianches* are: Inulin, glucose and fat otosenine, Pardaliancol. (Syed S 2014; Gupta D 2011)

Pharmacological studies

Doronicum hookeri has been reported for its antifungal, antimicrobial activity, antioxidant (Gupta D 2011) and hepatoprotective activities. (Syed S 2014) Recently cardio protective, anti-atherogenic and reducing effects of blood pressure have been shown.

Antimicrobial studies:

In an in-vitro study, *Streptococcus faecalis* was grown in nutrient agar media in an in vitro experiment with the addition of a mixture of dichloromethane and extracts of *Doronicum hookeri* in various concentrations in methanol (1:1, v/v). The extract's antibacterial action was demonstrated by the fact that at 500 g/ml concentrations, the bacteria's growth was hindered. Around 95% of enterococcal infections, such as infections of the urinary tract, infections of the biliary tract, ulcers (such as bed sores), wounds (especially abdominal), and sporadically endocarditis or meningitis, are caused by *Streptococcus faecalis* (*Enterococcus faecalis*). It has a typical digestive and vaginal flora. *Doronicum hookeri* Hook f. has been reported by Kumar VP (2006) for its antifungal activity. The in vitro antifungal activity of *Doronicum hookeri* has shown at doses of 1000 and 500 g/ml in the nutritional agar medium, the extract of the *Doronicum hookeri* rhizome was tested against *Saccharomyces cerevisiae* and *Candida albicans* and showed significant antifungal activity. (Kumar VP 2006; Okigbo R 2007; Shirazi M 2020)

Antioxidant study

Antioxidant activity of methanolic extract of *Doronicum hookeri* rhizomes' was assessed in vitro. This extract had a high phenolic content, which meant it had strong free radical scavenging and reduction abilities. Methanol extract demonstrated scavenging in the DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging experiment at a concentration of 0.5 mg/ml, which is close to the standard BHT (butylated hydroxytoluene) (85%). In addition, it demonstrated greater than 90% suppression of ABTS radicals than the dichloromethane extract at concentrations above 0.3 mg/mL. Nevertheless, dichloromethane extract had strong radical scavenging properties, including metal chelating, nitric oxide, and superoxide removal. (Gupta D 2011)

In another in vitro experiment, total reducing power and total phenolic content were used to assess the ethanolic and aqueous extracts' capacity to scavenge free radicals. The outcome indicated that the ethanolic extract had stronger antioxidant activity than the aqueous extract, and both extracts increased their antioxidant capacity in total reducing power tests in a dose-dependent manner. (Syed S 2014;)

Hepatoprotective activity:

Ethanollic and aqueous extracts of *Doronicum hookeri's* rhizomes were used to evaluate the hepato-protective efficacy against CCl₄-induced hepatotoxicity in Charles Foster albino rats. Only ethanolic extract, at a level of 500 mg/kg, was shown to partially protect the liver against CCl₄ toxicity. (Syed S 2014)

Toxicity study:

Acute toxicity study of Ethanolic extracts of *Doronicum hookeri* rhizomes, was done using three non-pregnant female rats. Rats were received 2g/kg b.w of ethanolic extract and they were monitored for 14 days to see if any of them died. After 14 days the extract was found to be safe in all the animals (Syed S 2014)

Conclusion

Darunaj Aqrabi is one of the most important medicinal rhizomes of Unani Medicine which is mentioned beneficial for various disorders like, Palpitation due to cold, plague, hemiplegia, bell's palsy, night mare, melancholia, flatulence, abdominal pain, constipation, low backache, vertigo, renal and bladder stone, plague, uterine pain due to accumulation of gasses, metritis, sciatica and useful in snake and scorpion bite. It also helps to maintain pregnancy and reduces pain during labour. Various pharmacological studies have been done and several are required, so it is concluded that the above review may be helpful for further scientific studies.

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References

- [1] Aiman F, Sidiqi A, Chaudhari SS, Aslam M, Mujeeb M, Parveen N *et al.* Ethnobotany and pharmacognosy of Darunaj Aqrabi (*Doronicum Hookeri* Hook. F.) with special reference of Unani medicine. International Journal of Botany 2021; 6(1): Pp-449-452
- [2] Anonymous. Qarabadi-i-Majidi. 9th edn. New Delhi: Waqf Hamdard All India Unani Tibbi Conference; 1986.
- [3] Anonymous. Qarabadi-i-Sarkari. 2nd edn New Delhi; 2006, 69.
- [4] Anonymous. The Unani Pharmacopoeia of India, Part II, Vol-1. New Delhi; 2009, 36,226.
- [5] Anonymous. The Unani Pharmacopoeia of India, Part II, Vol-3. Ghaziabad: Pharmacopoeia Commission for Indian Medicine & Homoeopathy. 2016, 1-2.
- [6] Arzani A. Qarabadi-i-Qadri. (Urdu translation). New Delhi: Central Council for Research in Unani Medicine 2009, Pp-173-174, 180.

- [7] Ghani HN. Khazainul Advia. Vol-4. New Delhi: Central Council of Research in Unani Medicine. 2010, 111-112
- [8] Gupta D, Bleakley B and Gupta RK. Phytochemical analysis and antioxidant activity of herbal plant *Doronicum hookeri* hook F. (Asteraceae). J Med Plants Res. 2011; 5(13): 2736–42.
- [9] Hafeez A. Qarabadin-I-Jadid. New Delhi: Central Council for Research in Unani Medicine; 2005: 54-55,198, 203, 216.
- [10] Hakim MA. Bustanul Mufradat. Telangana, India: Idara Kitab us Shifa 2015,267, 268.
- [11] Hooper D. Some Persian Drugs. Bull MiscInf. Royal Gard Kew: [Internet]. 1931 [cited 2020 May 29]; 1931(6):299. Available from: <https://www.jstor.org/stable/4102618>.
- [12] Ibn Baytar. Al-Jame Li Mufrad Al Advia wa Al-Aghzia. New Delhi: Central Council for Research in Unani Medicine. 2000.
- [13] Ibn Baytar. Al-Jame Li Mufrad Al Advia wa Al-Aghzia. Vol-3 New Delhi: Central Council for Research in Unani Medicine. pp. 271-275, IV 186,187,248, 249, 330, 331, 1999.
- [14] Ibn Sina. AL Qanun Fi'l Tib. Book II. New Delhi: Jamia Hamdard an autonomous university, 2010; pp. 210, 329, 416.
- [15] Kabiruddin M. Al-Qarabadin. New Delhi: Central Council for Research in Unani Medicine; 2006: 1228-29.
- [16] Kabiruddin M. Bayaz-e-Kabir, Part II. New Delhi; Idara Kitab as Shifa; 2010:169.
- [17] Kabiruddin. M. Makhzanul Mufradat. Idara Kitab us Shifa. 2014, Pp. 282, 283, 315, 481, 482.
- [18] Kalam MA, Ahmad G, Shahzad A, Maqbul SAA, Akhtar MS. Therapeutic Potential of Rhizomatous Plants Used in Unani Medicare System. In: Natural Bioactive Compounds. 2019: 409–64
- [19] Khan A. Muhit-i-Azam.Vol-02. New Delhi: Central Council for Research in Unani Medicine; 2013: 567-68
- [20] Khan MS. Bayaz-i-Khas (Urdu Translation). New Delhi: Ejaz Publishing House; 2006: 301, 310, 339, 341, 715-716.
- [21] Khare CP. Ayurvedic Phamacopoeial Plant Drugs Expanded Therapeutics. London (New York): CRC Press, Taylor & Francis Group; 2016: 231.
- [22] Khare CP. Indian Medicinal Plants An Illustrated Dictionary. Berlin/Heidelberg: Springer Science+Business Media, LLC; 2007: 223-224.
- [23] Kirtikar KR and Basu BD. Indian medicinal plants, Vol-2. Dehradun (Uttaranchal) INDIA: International Book Distributers 2012.
- [24] Kumar VP, Chauhan NS, Padh H, Rajani M. Search for antibacterial and antifungal agents from selected Indian medicinal plants. JEthnopharmacol. 2006; 107(2): 182–8.
- [25] Ines AF. Systematics of Eurasian and North African *Doronicum* (Asteraceae: Senecioneae). Ann Missouri Bot Gard. 2003; 90(3): 787–845.
- [26] Nabi MG. Makhzanul Mufradat. New Delhi: Central Council for Research in Unani Medicine 2007: 127.
- [27] Naseer M, Anwar M, Siddiqui MY. Cardioprotective Drugs With Especial Reference To Kitab Al-Adwiyah Al-Qalbiyah : a Review. WORLD J Pharm Sci. 2016; 5(9):2453–62.
- [28] Nasir M. Mufradat-i-Nasiri (Persian). Delhi: Qaisari Publication, 1984.

- [29] Okigbo R and Igwe D. Antimicrobial effects of Piper Guineense 'Uziza' and Phyllanthusamarus 'Ebe-Benizo' on *Candida albicans* and *Streptococcus faecalis*. *Acta Microbiol Immunol Hung* 2007; 54: 353–366.
- [30] Pullaiah T. *Encyclopedia of World Medicinal Plants Vol-2* [Internet]. New Delhi: Regency Publications; 2006: 817-18. Available from: www.regencybooks.com
- [31] Shirazi M, Abid M, Hussain F, Abbas A, Sitara U. Antifungal activity of some medicinal plant extracts against soil-borne phytopathogens. *Pakistan J Bot.* 2020; 52(2): 679–85.
- [32] Syed S. Study to Evaluate the Antioxidant and Hepatoprotective Activities of Roots Extracts of *Doronicum hookeri* in CC14 Treated Rats. *European J Med Plants.* 2014; 4(6): 675–85.
- [33] Yilin C, Yousheng C, Brouillet L, Semple JC. Tribe ASTEREAE. Vol-20. Science Press (Beijing) & Missouri Botanical Garden Press (St. Louis). 2011, 545–652 p.

