

A Complete Review of - Fafonia Cretica

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ABSTRACT: Within the family Zygophyllaceae, the genus Fagonia comprises around 35 species of wild flowering plants, such as *F. cretica*, *F. indica*, *F. arabica*, *F. laevis*, *F. californica*, *F. glutinosa*, and *F. scabra*. Traditional healers have utilized the whole plant or distinct sections of these species in ethnobotanical treatments for a variety of ailments. *Fagonia* is known locally as *dhamasa*. In the form of internal and exterior conventional formulations, they are traditionally well recognized for treating fever, leprosy, sores, hemorrhoids, and inflammation. The complete plant of *F. schweinfurthii* can be cooked in water to make a bath that helps with allergies and other skin conditions, or the decoction can be taken orally as a blood purifier. The powder, which is made up of the entire plant, can be applied to boils and skin eruptions to promote healing. Other species, such as *Fagonia bruguieri*, are said to have anti-allergy properties in their aqueous extract. The unique chemical contents of the genus—which include proteins, amino acids, coumarins, trace elements, alkaloids, terpenoids, sterols, and flavonoids—attracted research from all over the world. Obesity is one of the key life style problems which may lead to unfavorable effects on cholesterol, triglycerides, blood pressure and insulin resistance and eventually raises the chance of numerous bad illnesses including ischemic heart disease, stroke, coronary artery disease & type 2 diabetes. When compared to the obese control group, the administration of a methanolic extract of *Fagoniacretica* L. effectively prevented the rise in daily food consumption and body weight gain. Rats in all treatment groups showed improvements in their lipid profiles when compared to the obese rats in the control group. The data obtained confirm that adding *Fagoniacretica* L. Methanolic extracts significantly protected obese rats against many obesity markers. Owing to their secondary active metabolites, plants provide an alternate source of natural medicines. *Shigella flexneri*, *Escherichia coli*, and *Salmonella typhi* are among the multidrug-resistant gastrointestinal pathogens that were tested against *Fagoniacretica* extracts and

Gradient High-Pressure Liquid Chromatography fractionations. To identify antibacterial chemicals, bioactive HPLC fractions were subjected to ESI-MS/MS analysis. The plant nanoparticles' predicted capacity to modify genes involved in the extrinsic apoptotic pathway offered new therapeutic possibilities for the efficient treatment of cancer and increased bioavailability of plant metabolites. It will take more research to determine if this plant is a "friend" or a "foe" in the clinical trials that would save mankind from manmade chemical medications.

I. INTRODUCTION :-

1. History :

Among Indian texts, the Rigveda, written between 4500 and 1600 BCE, has the first mention of using medicinal herbs. There is an abundance of literature on the subject of medicinal plants dating back to 1600 BCE, and the first chapter of the Vrihat Samhita gives a detailed description of the first symposium on the subject ever convened. Because this ancient medicine is still so embedded in our society, 75% of Indians still turn to it for treatment. Scientific proof of the efficacy of these plant-based remedies, which have been used for such a long time, is essential given the significant portion of the population that takes herbal remedies. Herbal medicine, utilized for generations in impoverished countries, is today being actively promoted by the World Health Organization. It has been found that 3000 plants from the tropical forests of India and other countries are medicinally useful. The active ingredients from these plants are worth around \$2,000,000,000 for the US market alone, and about \$8 billion worldwide. The scientific advancements in the fields of pharmacology and toxicology in the western hemisphere have led to an increase in the creation of natural ingredient-based drugs in Europe and the United States. In India, the need of this kind of analysis was long acknowledged, and some 45 years ago, Sir Ramanath Chopra initiated the first systematic study with these goals in Calcutta. Originally, the field of medicine focused

on plants with therapeutic properties. The search for medicinal plants has yielded several plants that are very helpful in treating ailments and improving health throughout the period of several centuries. One may say, more or less correctly, that there is a plant that grows in nature that can cure any condition. Moose has recently talked about a range of herbal remedies that may be used on their own.[1]

2. Biological Source :-

According to a historical book, dried aerial portions of the very promising medicinal plant *Fagoniacretica* are used in folk medicine to treat a variety of ailments. Significant bioactive substances found in plants include glucoside, flavonoids, saponins, triterpenes, and pharmacological properties. *Fagoniacretica* is a species of flowering plant that belongs to the *Zygophyllaceae* family. It is often referred to as *Dhamasa* or *Cretan tea*. An extensive synopsis of its biological origins is provided below:

2.1 Taxonomy:

Kingdom: Plantae - *Fagoniacretica* is a member of the Plant kingdom, encompassing all plants.

Phylum: Angiosperms - This plant belongs to the group of flowering plants, which produce seeds enclosed within a fruit.

Class: Eudicots - *Fagoniacretica* is classified within the Eudicots, a major group of flowering plants characterized by having two seed leaves (cotyledons) in their embryos.

Order: *Zygophyllales* - Within the class Eudicots, *Fagoniacretica* is part of the order *Zygophyllales*, which includes other plants like the creosote bush (*Larrea tridentata*).

Family: *Zygophyllaceae* - *Fagoniacretica* belongs to the *Zygophyllaceae* family, which consists of around 285 species of flowering plants distributed in warm and arid regions worldwide.

Genus: *Fagonia* - This genus comprises approximately 30 to 40 species of small shrubs and herbs, commonly found in dry regions across Africa, Asia, and Europe.

Species: *Fagoniacretica* - This specific species is native to the Mediterranean region, including countries like Greece, Cyprus, and parts of North Africa.



(fig.01) Flower of *FagoniaCretica*

2.2 Distribution and Habitat:

The Mediterranean area, which includes nations like Greece, Cyprus, Turkey, and portions of North Africa, is home to *Fagoniacretica*. It grows best in semi-arid and arid regions; it usually occurs on rocky, sandy soils and limestone outcrops. The plant is commonly found in coastal and low-lying inland locations because to its excellent adaptation to arid conditions characterized by scorching summers and mild winters.

3. Chemical composition :-

It has been stated that *Fagoniacretica* contains coumarins, saponins, cardiac glycosides, and alkaloids. Flavonoids, glycosides, sapogenins, and saponins are present in another species of *Fagonia indica*.

Many types of plant metabolites, including some significant groups like saponins, sapogenins, alkaloids, glycosides, vitamins, terpenoids, tannins, flavanoids, steroids, proteins, amino acids, coumarins, and trace elements, were isolated over an extended period of time through various studies conducted on various *Fagonia* species. a thorough list of various recognized and chosen species of fagonos and their components, including plant parts. Three sapogenins have been identified from the aerial component of *F. indica* plants and are known as nahagenin-1, hederagenin-2, and ursolic acid-3, according to preliminary phytochemical screening on the plant's shoot system (Rahman A et al., 1984; Rahman A et al., 1982).

And several saponins or triterpenoid glycosides have been isolated, they were characterized aspinatol-4, 23,28-di-O-β-D-glucopyranosyltaraxer-20-en-28-oicacid20,3β,28-di-O-β-D-glucopyracid20,21,22æpoxy-23-O-β-D-glucopyranosyl nahagenin, 3-O-β-D-glucopyr-

anosyl-(1→2)] [α-1-arabinopyranosyl-(1→3)]-α-1-arabinopyranosyl}ursolicacid-28-O-[β-d-glucopyranosyl] ester (indicasoninA)-5, and 3-O-[[β-d-glucopyranosyl (1→2)] -[α-1-arabinopyranosyl (1-3)]-α-1-arabinopyranosyl] oleanolic acid-28-O-[β-d-glucopyranosyl] ester (indicasoninB)-6 (Anil P et al, 2012; Shehab NG et al, 2011). Four flavonoidal compounds identified as quercetin-7, isorhamnetin-α-3-Orhamnoside-8, Quercetin-3-O-β-D-glucopyranosyl(1"-6")-β-D-glucopyranoside and quercetin 3-O-β-D galactopyranosyl(6"--1")-α-L-2"acetylramnose (3"-1")β-D-glucose were isolated from the alcoholic extract and also oleanolic acid-9, β-sitosterol-3-O-β-D-glucoside-10, and stigmaterol-3-O-β-D-glucoside-11 (Shehab NG et al, 2011). Indicacin-12 and fagonicin-13 are the two new compounds and also β-amyrin-14 and lupeol-15 were isolated from aerial parts of *F. indica* (Farheen R et al, 2015; Shaker KH et al, 1999).

4. Microscopic Characterization :-

4.1. Seed : D-shaped growth is seen in *fagonia* seeds. The seed is 2.5–3.5 x 2.1–2.8 mm. The morphology of epidermal cells is unclear, with 5–6 gonals. The periclinal cell wall is dome-shaped and flat. [2]

4.2 Stem: The stem's transverse part is made up of asymmetrical circular shapes. The single layer rectangular cells that make up the epidermis are encircled by a thin layer of cuticle. Collenchymatous and parenchymatous cells make up the cortex. Medullary rays, phloem, and xylem are found in the stellar area. Spots in the xylem have a wedge form. Over metaxylem, phloem is starting to emerge like caps. Medullary rays, which resemble wheel spokes, are made of long, parenchymatous cells with thin walls that are densely packed with starch granules. [3]

4.3 Leaf: The epidermis of a leaf is equilateral, single-layered, and mostly made up of tangentially elongated cells that are heavily cuticled. Acellular stomata, or polygonal epidermal cells, are seen in both the loftier and subordinate epidermis when viewed in surface view. Palisade cells in two or three layers next to the epidermis on each side. The phloem is seen above and the xylem below in the vascular bundle. A bundle cap called scleral tissue forms directly over the phloem. There is also a little outside vascular bundle within the lamina. There are eleven to fourteen venous islets. In the lower epidermis, the stomatal index is 16–17, whereas in

the upper epidermis, it is 5–7. a palisade ratio of two or three in the top layer of the skin and two to four in the bottom layer. [4,5]

4.4 Powder: Powder microscopy revealed: fragments of testa in surface view showing polygonal thick walled cells; fragments of longitudinally cut thick walled, lignified groups of sclerenchymatous cells of mesocarp often seen overlapping with the underlying cells of endocarp; isolated and groups of stone cells; fragments of fibrous layer of anther in surface view; radially longitudinally cut medullary rays crossing the bordered pitted vessels, anomocytic stomata, and lignified cork in surface view. [6]

5. Diffrents Parts Of *fagoniaCretica* :-

Several triterpenoid saponins, including sapogenin, nahagenin, and oleanolic acid, are found in the aerial portions. In addition to flavonoids, aerial portions also yielded diterpenes, fagonone, and its derivatives. Following their isolation from the leaves and blossoms, the flavonoids quercetin and kaempferol shown antibacterial action. *Fagoniacretica*, a little blooming plant endemic to the Mediterranean region, is sometimes referred to as Cretan tea. It is especially common in places like Greece and Cyprus. It is a member of the Zygophyllaceae family and is distinguished by its spiky stems and tiny, fragile blooms.

Description:

Look: *Fagoniacretica* usually grows to a height of 10 to 30 cm as a low-lying shrub. It has tiny, oppositely oriented, green leaves that are either lanceolate or linear in form.

Flowers: *Fagoniacretica* blooms typically have five petals, a yellow center, and are white or pale pink in color. They thrive in dry environments, and their springtime blooms bring a burst of color to the area.

Stems: *Fagoniacretica* stems are woody, thin, and coated with tiny, sharp spines called prickles that act as a protection against herbivores.

Habitat : *Fagoniacretica* grows well in rocky, arid environments; it is frequently seen growing in sandy soils, on limestone outcrops, and along the shoreline. It is a plant that grows well in desert places with hot summers and mild winters because it is tolerant of drought and harsh climatic conditions.

Traditional Uses:

Medicinal Purposes: Traditional medicine has historically used fagoniacretica, especially in Mediterranean civilizations. It is said to possess a number of therapeutic qualities, such as diuretic, antioxidant, and anti-inflammatory actions. Skin diseases, respiratory infections, and digestive issues have all been treated with it.

Culinary Uses: Fagoniacretica has been utilized in several culinary cultures, while its usage in medicine is more widespread. The plant's leaves are occasionally made into a tea that is said to offer health advantages and a pleasant flavor in some regions of Greece and Cyprus.

6. Medicinal Values

6.1 Bark :- The bark of the Fagoniacretica plant, commonly referred to as Dhamasa or Cretan tea, has long been utilized for its therapeutic qualities around the world, but especially in the Mediterranean and South Asian countries. This is a thorough summary of the benefits of using Fagoniacretica bark as medicine:



(fig.02) Bark of FagoniaCretica

Traditional Uses :-

Anti-inflammatory Properties: Traditional medicine has traditionally utilized the bark of the Fagoniacretica plant as a natural treatment for inflammatory diseases. It may be helpful for ailments including rheumatism, arthritis, and inflammatory bowel disease as it is thought to help lower inflammation in the body.

Antioxidant Activity: Antioxidant-containing substances found in fagonian bark help shield cells from oxidative damage brought on by free radicals. Antioxidants are essential for preserving general

health and may aid in the prevention of a number of chronic illnesses, such as cancer and cardiovascular disease.

Diuretic Effects: In traditional herbal medicine, fagoniacretica bark is also used as a diuretic, which promotes urine output and helps the body eliminate excess fluid. Its diuretic action may be advantageous for those with edema (fluid retention) or urinary tract infections.

Antimicrobial Activity: According to some research, extracts from the bark of Fagoniacretica may have antibacterial properties against some types of fungus and bacteria. Its historic usage in the treatment of infections and the promotion of wound healing may be attributed to its antibacterial effect.

6.2 Leaf :-

Fagoniacretica, also referred to as Dhamasa or Cretan tea, has a long history of usage in traditional herbal medicine, especially in its native Mediterranean area. The leaves of Fagoniacretica are particularly interesting due to their possible health advantages, even if other sections of the plant, such as the stems and flowers, have been used for their medicinal qualities. Below is a comprehensive summary of the leaves' therapeutic properties:



(fig.03) Leaf of FagoniaCretica

Anti-inflammatory: Fagoniacretica leaves have long been utilized for their anti-inflammatory qualities. They have been used to reduce the discomfort brought on by inflammatory diseases such as rheumatism, arthritis, and joint pain.

Digestive Health:The leaves of *Fagoniacretica* are said to offer digestive effects in traditional herbal therapy. They may be used to relieve indigestion, ease stomach discomfort, and support the health of the gastrointestinal system as a whole.

Respiratory Health:The leaves' possible respiratory advantages are another reason for its significance. To assist relieve the symptoms of respiratory infections, coughing, and congestion, they can be prepared into a tea or infusion and ingested.

Antioxidant Activity:The leaves of *Fagoniacretica* contain chemicals that have antioxidant qualities, just as other components of the plant. By aiding in the body's defense against damaging free radicals, these antioxidants lessen oxidative stress and may even reduce the chance of developing chronic illnesses.

7.1. Geographic Distribution:-

Fagoniacretica, a species of flowering plant of the *Zygophyllaceae* family, is also referred to as Cretan fagonbush. It is indigenous to the Mediterranean area, namely to the nations that round the Mediterranean Sea on its eastern side: Greece, Cyprus, Turkey, Syria, Lebanon, Israel, and Palestine.

Typically, this species is found in rocky slopes, dry hillsides, and the fringes of deserts that are semi-arid or dry. It is prevalent in arid, rocky settings because it is well-adapted to survive in tough situations with little water availability and high temperatures.

Fagoniacretica's geographic distribution can change within its range according to regional environmental elements such soil type, elevation, and precipitation patterns. Growing at different heights, from sea level to around 1500 meters (4900 feet), it may be found.

Fagoniacretica tends to favor wide spaces with well-drained soil and lots of sunlight when it comes to preferred habitats. Frequently, it grows into prickly, thick bushes with tiny, thin leaves and pink to violet blooms. Usually blooming from late spring to early summer, these blooms draw pollinators like butterflies and bees.

Although *Fagoniacretica* is not listed as endangered, habitat degradation, excessive livestock grazing, and other human activities may pose hazards to it in some locations. The preservation of this species and its distinct ecological roles may need conservation measures.

7.2. Collection of *Fagoniacretica* :-

Gathering *Fagoniacretica*, or Cretan fagonbush, usually entails gathering particular plant components for research, culinary, or medicinal uses. This is a thorough rundown of the methods used to gather *Fagoniacretica*:

1. Identification and Location:

- The goal and the portion of the plant being picked determine when to gather. Timing is critical since the active ingredients in a plant might change based on its growing stage when used medicinally.
- When flowers are at their peak, which is normally in late spring or early summer, they are gathered. While stems and leaves can be gathered all during the growing season, for best quality, they are usually picked before they blossom.

3. Harvesting Methods:

- Different portions of the plant may be picked depending on the intended application. The aerial components (leaves, stems, and flowers) are often gathered for therapeutic uses.
- Typically, harvesting is done by hand, with the plant components being cut using scissors or pruning shears. To protect the plant and maintain the population's sustainability, handling it carefully is crucial.

4. Processing and Drying:-

- Following harvesting, the plant material could go through drying, sorting, and cleaning processes.
- Cleaning is the process of taking out of the collected material any dirt, trash, or undesired plant components.
- Sorting guarantees that only superior plant material is chosen for additional processing.

5. Storage and Transportation:

- To preserve its freshness and potency, the gathered plant material is often kept dry and sealed in airtight containers away from light and moisture.
- To guarantee traceability and avoid confusion with other plant species, proper labeling is crucial.

7.2. Cultivation of *Fagoniacretica* :-

While gathering wild specimens is more common, it is possible to cultivate *Fagoniacretica*, often known as Cretan fagonbush, under certain situations. This is a thorough rundown of the cultivation procedure:

1. Site Selection:

- Because Fagoniacretica grows best in dry and semi-arid conditions, choosing the right spot for growth is essential to its success.
- Fagoniacretica enjoys arid, rocky settings, so pick a spot with lots of sunlight and well-drained soil.

2. Soil Preparation:

- Clear the area of any garbage, rocks, and weeds that might impede the development of plants.
- Notwithstanding the fact that Fagoniacretica is suited to soils deficient in nutrients, you should nevertheless treat the soil if needed to increase its fertility and structure.

3. Propagation:

- Cuttings or seeds can be used to propagate Fagoniacretica. Mature plants can provide seeds, while robust, well-established specimens can yield cuttings.
- Sow seeds close below the surface in early spring in well-drained soil. Till germination, keep the soil continually wet.

4. Planting:

- When seedlings or rooted cuttings are ready, place them in the prepared soil at the appropriate distance apart, usually between 30 and 60 cm, depending on the growth habit that is required.
- To aid in their establishment in their new surroundings, give recently planted seedlings or cuttings plenty of water.

5. Watering:

- Fagoniacretica can withstand droughts once it has established, but continuous irrigation is necessary while it is establishing.
- To promote deep root development and drought resilience, water thoroughly yet seldom.

6. Harvesting:

- Fagoniacretica can be harvested for its leaves, stems, or flowers, according on the desired application.
- After the plants have achieved maturity, which normally happens after one to two years of development, harvesting may start.

7. Pest and Disease Management:

- Although fagoniacretica is largely resistant to pests and diseases, aphids and powdery mildew are occasionally encountered pests.
- Regularly check the plants for indications of pests or diseases, and if needed, take appropriate action using cultural methods or organic insecticides.

8. Environmental Considerations:

- To reduce environmental harm, take into account the ecological effects of growing Fagoniacretica and implement sustainable techniques.
- When cultivating native plants, abide by local ordinances and rules and refrain from bringing in invasive species.

8. Phytoconstituents of fagoniacretica:-

Sr.	Constituents	Information In Detail AboutOf Constituents
1.	Flavonoids	Flavonoids are a group of polyphenolic compounds known for their antioxidant, anti-inflammatory, and anticancer properties. Examples of flavonoids found in Fagoniacretica include quercetin, kaempferol, and rutin.
2.	Triterpenoids	Triterpenoids are secondary metabolites with various pharmacological activities, including anti-inflammatory, antiviral, and hepatoprotective effects. Fagoniacretica contains triterpenoids such as oleanolic acid and ursolic acid.
3.	Alkaloids	Alkaloids are nitrogen-containing compounds with diverse biological activities. They may exhibit analgesic, anti-inflammatory, and antimicrobial properties. Examples of alkaloids found in Fagoniacretica include fagonimine and fagoniacine.

4.	Tannins	Tannins are polyphenolic compounds known for their astringent properties. They have antioxidant, antimicrobial, and wound-healing effects. Tannins are present in Fagoniacretica and contribute to its medicinal properties.
5.	Saponins	Saponins are glycosides with detergent-like properties. They have been shown to possess anti-inflammatory, antifungal, and immunomodulatory activities. Fagoniacretica contains saponins that may contribute to its therapeutic effects.

9. Pharmacological Activity of FagoniaCretica :-

9.1. Anti-inflammatory and wound healing property :-

Saleh I. Alqasoumi et al. studied the effects of a 90% alcoholic extract of Fagonia schweinfurthii formed gel on carrageenan-induced rats paw edema and excision wound model, respectively, to determine the anti-inflammatory and wound healing properties of the gel. The results were contrasted with those of the wound-healing povidone-iodine (Betadine®) medication and the anti-inflammatory diclofenac sodium ointment (Diclomax®). After topically applying 0.5 g of the diclofenac sodium ointment and herbal gels to the plantar surface of the left hind paw, an anti-inflammatory response was seen in less than three hours. The excision wound of albino rats was treated with 0.5 g/wound of F. schweinfurthii gel and Betadine® once daily for 19 days, and the healing effect was monitored every 4 days. Gel compositions have been shown to have an increasing anti-inflammatory impact and quicken the healing process. According to this study, a gel formulation of F. schweinfurthii plant extract may be created as a medicinal agent with anti-inflammatory and wound-healing properties.[7]

9.2. Androgenic actively :-

On Fagoniacretica, Abirami V. et al. did research. The effects of an alcoholic extract of F. cretica's arial portions on the estrous cycle and implantation in female albino rats were studied. It was discovered in the study that Fagoniacretica causes distortion in the regularity of the rats' estrous cycle, causing the heat period (estrous phase) to be randomly omitted. Its disappearance index, +53.33, explains why females are less inclined to want to mate with makes. It had a notable antiimplantation effect when given at a p.o. dosage of 250 mg/kg. Given that the weights of the ventral prostate and seminal vesicles both increased

relative to the control value, the drug solution has a strong androgenic effect. administered that the results obtained from therapy with testosterone propionate were not significantly affected when the two were administered together, it does not appear to exhibit any antiandrogenic effect.[8]

9.3. Anti-allergic property :-

Al- Tahya et al. investigated the anti-allergic property of Fagoniabrugueri. In this the whole plant Fagoniabrugueri DC. was extracted with boiling water and freeze-dried. The LD50 values of the dried extract were found 11.5 and 10.75 g/kg i.p. in mice and rats, respectively. Treatment of albino guinea-pigs with the extract in doses of 200 mg/kg (i.v.) or orally antagonized histamine (20 µg/kg i.v.) and capsaicin (100 µg/kg i.v.) induced bronchoconstriction without affecting that induced with ACh and 5-HT. The percentage antagonisms were 72 ± 0.9 and 65 ± 4% against histamine and capsaicin, respectively (P < 0.01, N = 10). Exposure of conscious guinea-pigs to histamine aqueous aerosols (10 mg/ml) induced initial graspings and reversible loss of consciousness within 5 minutes. Treatment of the guinea-pigs with the extract in doses of 1.25 g/kg (i.p.) for 20 minutes or orally for 2 hours protected significantly the animals against histamine-induced grasps and loss of consciousness (P < 0.01, N = 11).[9]

9.4. Neuroprotective activity :-

Avinash K Rawal et al. reported the neuroprotective activity of three herbs Rubia cordifolia (RC), Fagoniacretica linn (FC) and Tinospora cordifolia (TC). In study Hippocampal Slices were subjected to OGD (oxygen glucose deprivation) and divided into 3 groups: control, OGD and OGD + drug treated. Cytosolic Cu-Zn superoxide dismutase (Cu-Zn SOD), reduced glutathione (GSH), glutathione peroxidase (GPx),

nitric oxide (NO) was measured as nitrite (NO₂) in the supernatant and protein assays were performed in the respective groups at various time intervals. EPR was used to establish the antioxidant effect of RC, FC and TC with respect to superoxide anion (O₂⁻), hydroxyl radicals (.OH), nitric oxide (NO) radical and peroxy nitrite anion (ONOO) generated from pyrogallol, menadione, DETA-NO and Sin-1 respectively. RT-PCR was performed for the three groups for GCLC, iNOS, Cu-Zn SOD and GAPDH gene expression. In result they were found that all the three herbs were effective in elevating the GSH levels, expression of the gamma glutamylcysteine ligase and Cu-Zn SOD genes. The herbs also exhibited strong free radical scavenging properties against reactive oxygen and nitrogen species as studied by electron paramagnetic resonance spectroscopy. In addition all the three herbs significantly diminished the expression of iNOS gene after 48 hours which plays a major role in neuronal injury during hypoxia/ischemia.[10]

9.5. Endocrinological property :-

The effects of the powdered Fagoniacretica plant and its two main triterpenoid saponins (saponin-I and saponin-II) on a range of blood endocrinological indicators were studied by Asif et al. Prolactin, specifically the levels of cortisol, thyrotropin, thyroxine, and prolactin in the serum of healthy male rabbits, was studied. Its ethanolic extract was separated into two main triterpenoid components, saponin-I and saponin-II, using repeated chromatography on silica gel, sephadex LH-20, and biogel P-2. By comparing the ¹H and ¹³C NMR chemical shift values of these compounds with previously published values of related compounds, these chemicals were discovered. Using radioactive I¹²⁵, a radio-immunological test was employed to estimate the blood hormone levels of animals treated with crude drugs and saponin. The NE-1612 gamma scintillation counter was then used to measure the radioactivity of the standard and the unknown material in each case for a duration of 90 seconds. Prolactin and serum TSH levels were significantly reduced by both 30 mg dosages of saponins as compared to the crude drug treatment and control groups. After 16 days, the effects of the crude medication and saponin-I were not statistically significant on thyroxine, but saponin-II, at a 30 mg dosage, also considerably decreased the level of thyroxine. Both saponins in 30 mg flowers and the crude medication in a 1g dosage significantly raised blood cortisol levels. With saponin-II, the

serum cortisol increased to its maximum after 16 days.[11]

9.6. Antimicrobial activity

Anjum et al. investigated the antibacterial activity of the ingredients in Fagoniacretica. Eleven chemicals have been identified from the methanolic extract of the whole *F. cretica* plant in this investigation. The methanolic extract was separated into soluble fractions that were compatible with water, n-hexane, EtOAc, and n-BuOH. Eleven compounds, including linoleic acid, β-sitosterol-3-O-β-D-(6-hexadecanoyl)-glucopyranoside, methyltriacontanoate, teraxerol, β amyryl acetate, oleanolic acid, octacosanoic acid, tetraaxerone, arjulonic acid, and 23-hydroxy ursolic acid were identified through repeated silica gel column chromatography and preparative TLC of n-hexane and EtOAc soluble fractions. The antibacterial activity of the separated chemical was examined by testing. It showed a strong antibacterial response against *Salmonella typhi*, *Trichophyton longifusus*, *Aspergillus flavus*, *Candida albicans*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Shigella flexneri*, *Staphylococcus aureus*, and *Bacillus subtilis*. [12]

9.7. Analgesic and Antimicrobial activity :-

The antimicrobial and analgesic properties of the ethanol and aqueous extracts of *Fagonia indica* leaves are assessed by Sharma S. et al. By monitoring the zone of inhibition, the antimicrobial activity of *Fagonia indica* leaf extracts (25, 50, and 100 mg/ml) was evaluated against gram-positive and gram-negative bacterial strains. The microorganisms that were employed in this investigation were *Bacillus cereus* (ATCC 6633), *Pseudomonas aeruginosa* (ATCC 27853), *Staphylococcus aureus* (ATCC 29213), and *Escherichia coli* (ATCC 25922). Rats were used to test solvent extracts (200 and 400 mg/kg) of *Fagonia indica* using the tail flick technique. Regression analysis was used to statistically examine the data. The findings demonstrated that all bacterial strains were significantly inhibited by the ethanol extract, with *Bacillus cereus* showing the greatest inhibitory impact and *Pseudomonas aeruginosa* showing the least inhibitory effect. Both the water and the ethanol extracts exhibited considerable (p<0.05) analgesic efficacy. [13]

9.8. Cytotoxic and antitumor activity :-

Fagoniacretica's cytotoxic and anticancer properties were noted by Ahsan Hussain et al. In the study, cytotoxic, antitumor (potato disc), and

DNA damage assays were used to assess this data in a lab setting. At LD50 118.89 ppm, the extract exhibited significant cytotoxic action against brine shrimps, and an antitumor test revealed that it prevented the formation of tumors on potato discs. All three of the tumor-inducing *Agrobacterium* strains studied (At6, At10, and At77) showed significant anticancer efficacy, with At10 showing the highest tumor inhibition (77.04%). On the other hand, no DNA-damaging activity or fatal activity against strains of *Agrobacterium tumefaciens* was identified in the extract. Overall, the findings point to this plant's substantial anti-cancerous potential.[14]

According to Matt Lam et al., an aqueous extract of *Fagoniacretica* can activate the DNA damage response and cause cell cycle arrest and death through both p53-dependent and independent methods. They further demonstrate that in the absence of p53, FOXO3a is necessary for activity. According to their research, the aqueous extract of *Fagoniacretica* may include anti-cancer compounds that work alone or in concert to inhibit the growth of breast cancer cells by inducing the production of p53 and FOXO3a through DNA damage.[15]

The impact of *Fagonia indica* on rat tumors created in an experiment was studied by Soomro AL et al. It was discovered that the rats given the begonia extract had a noticeably longer survival rate than the group under control. Female rats in the treatment group had a survival rate of 83.2+12.67 days (range 55-118 days), whereas male rats had a survival rate of 59.4+ 10.07 days (range 39-98 days). The survival rate for untreated female rats was 38.9+4.16 days (range 21-57 days), whereas the survival rate for untreated male rats was 17.0+2.55 days (range 10-27 days). In both the male and female rats, the difference in survival between the treated and untreated groups was statistically significant ($P < 0.01$), with the females showing a substantial difference ($P < 0.01$). The difference in the length of time that male and female rats survived in the treatment group. There was no discernible difference in the survival rates of male and female rats in the non-treated group ($P > 0.1$). According to the results of this preliminary study, an aqueous infusion of *Fagonia indica* has a tumorostatic effect that is more pronounced in females.[16]

10. Adverse Effects of *Fagonia Cretica* :-

Agoniacretica is a blooming plant endemic to desert parts of Asia and Africa. It is also referred to as "Dhamasa" or "Dhamaso" in

certain places. Due to its supposed health advantages, it has been traditionally employed in a variety of folk remedies, particularly for the treatment of gastrointestinal problems, diabetes, and inflammation. *Fagoniacretica*, like many herbal treatments, can have negative side effects as well, particularly if taken incorrectly or in excess. The following are a few possible side effects of *fagoniacretica*:

10.1. Gastrointestinal Issues: Abdominal pain, nausea, vomiting, diarrhea, and other gastrointestinal problems are possible side effects of consuming *Fagoniacretica*. Depending on each person's tolerance and the quantity ingested, the intensity of these effects might change.

10.2. Allergic Reactions: *Fagoniacretica* can cause allergic responses in certain people, particularly if they are sensitive to other plants in the *Zygophyllaceae* family, which includes this plant. Skin rashes, itching, swelling, and even respiratory symptoms like trouble breathing all be signs of an allergic response.

10.3. Hypoglycemia: The traditional usage of *fagoniacretica* stems from its alleged anti-diabetic effects. While those with high blood sugar levels may benefit from this, taking too much *Fagoniacretica* may cause hypoglycemia by lowering blood sugar levels too much. This may result in symptoms including lightheadedness, weakness, disorientation, and in extreme situations, unconsciousness.

10.4. Interactions with Medications: Certain drugs, especially those used to treat diabetes, high blood pressure, or blood coagulation, may interact with *fumoniacretica*. For instance, it could intensify the effects of anticoagulants or anti-diabetic medications, raising the risk of bleeding or hypoglycemia, respectively. It is imperative that anybody on prescription medicine speak with their healthcare physician prior to utilizing any herbal supplement, including *Fagoniacretica*.

10.5. Pregnancy and Lactation: Scientific information about the safety of *Fagoniacretica* during nursing and pregnancy is scarce. Because the effects of this plant on the health of the mother and fetus are unknown, women who are pregnant or nursing should use caution and speak with a healthcare provider before using it.

10.6. Liver and Kidney Toxicity: Fagoniacretica has not been well investigated, although there is some worry that long-term or excessive usage may have harmful effects on the kidneys or liver. Before consuming this herb, those with a history of liver or renal disease should exercise extra caution and see a physician.

10.7. Drug Contamination: There is a chance that areas where Fagoniacretica is collected in the wild or acquired from unrestricted sources may be contaminated with pesticides, heavy metals, or other dangerous materials. When tainted Fagoniacretica products are consumed, there can be major health hazards.

11. Marketed formulation fagoniacretica :-

Particular commercially produced forms of Fagoniacretica may not be readily available worldwide, particularly under recognizable brand names. However, it's feasible that regional producers or firms that deal with herbal medicine may create formulations or products that include extracts or derivatives of Fagoniacretica in areas where it's historically utilized.

These commercialized formulations might take a number of shapes, such as:

1. Capsules or Tablets: For oral ingestion, fagoniacretica preparations can be compressed or encapsulated in tablets. Users who favor easy administration and standardized dosages will typically find these formulations handy.

2. Powders: Dried plant material or fagoniacretica extracts can be powdered to a fine consistency and then packed for application. Powders offer a versatile dosage option that may be consumed by adding them to water, juice, or smoothies.

3. Teas or Infusions: Herbal infusions and teas can be made with dried Fagoniacretica flowers or leaves. These preparations, which come in loose leaf or tea bag form, are frequently eaten due to their alleged health advantages.

4. Tinctures or Extracts: You might be able to get Fagoniacretica liquid extracts or tinctures made with alcohol. You may utilize these formulations by adding drops to water or other liquids, and they usually provide concentrated amounts of the plant's active ingredients.

5. Topical Preparations: Certain formulations, including creams, lotions, or ointments with extracts from Fagoniacretica, may be intended for topical use. These goods could be sold as treatments for inflammatory diseases or skin ailments.

II. CONCLUSION :-

Fagoniacretica, also known as Dhamasa or Dhamaso, is a flowering plant with a long history of traditional use in various folk medicines for its purported health benefits. While it has been traditionally used to treat conditions such as diabetes, inflammation, and gastrointestinal issues, scientific evidence supporting these claims is limited.

Research on Fagoniacretica's pharmacological properties and potential therapeutic effects is still in its early stages, and many of the reported benefits are based on anecdotal evidence and traditional knowledge. While some studies have suggested possible biological activities, including anti-inflammatory, antioxidant, and anti-diabetic properties, more rigorous scientific research, including clinical trials, is needed to confirm these effects and elucidate the mechanisms of action.

Despite its potential benefits, it's important to recognize that Fagoniacretica, like many herbal remedies, may also have adverse effects and interactions with medications. Individuals considering its use should exercise caution, especially if they have underlying health conditions, are taking medications, or are pregnant or breastfeeding. Consulting with a healthcare professional before using Fagoniacretica or any herbal supplement is advisable to ensure safe and appropriate use.

Furthermore, the quality and safety of commercially available formulations of Fagoniacretica can vary, and consumers should purchase products from reputable manufacturers who adhere to quality control standards and regulatory guidelines.

In summary, while Fagoniacretica shows promise as a potential therapeutic agent, further research is needed to fully understand its benefits, risks, and optimal uses. Until then, individuals should approach its use with caution and rely on evidence-based recommendations from healthcare professionals.

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