

Passiflora Incarnata Is Used in The Treatment of Anti -Inflammatory

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Abstract— The main source of bioactive compound for human is the Passiflora family has the main source of bioactive compound for human being, which include approximately 520 species of dicotyledonous plants. *Passiflora incarnata* and *P. alata*, are also known as maypop. The phytochemical properties of these fraction and the relevant in vivo biological activities (antioxidant, anti-inflammatory, antibacterial and antifungal) in vivo control (asthma, hypertension, osteoarthritis, diabetes and pulmonary fibrosis) are also discussed. This review is current state knowledge about cyclooxygenase (COX -2). Many compounds have been isolated mainly alkaloids, flavonoids, phenols and carbohydrates *Passiflora incarnata* has been describe as passion flower, is widely and used to treat many ailments such as anxiety, insomnia, convulsion, sexual dysfunction, cough and anti -inflammatory. The ability to live a health, diseases – free life is a gift of medicinal plants to humans. This is necessary to protect our health. India one of the most medically and cultural countries in the world with a long history of the use of medicinal plants, a tradition that is still highly valued today.

Index Terms— Anti- inflammatory, *Passiflora*, *Passiflora incarnata* COX inhibitors, Apigenin, Flavonoids, Pulmonary fibrosis.

1. Introduction

The genus *Passiflora* contain of 500 species which are mostly found in warm and tropical regions. *Passiflora* comes from Latin word “Passio” that was first time discovered by Spanish in 1529 and was described as a symbol for “Passion of Christ”. This plant was used universally in tradition medicine in West India, Mexico, Netherland, and south, America, Italia and Argentina. One of species of this genus named as *P. incarnata* (*Passifloraceae*) is more popular than its other species. *P. incarnata* (passion flower family) is a wide spreading climber, native of South East United State of America, grown frequently in garden as an ornamental.

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Steam wiry, leaves three lobed and serrate, flower pale pink in colour, fruits ovoid or globose.

This is a fine mountaineer suitable for covering arbours verandahs and arches. It can be propagated by seed or layering. A fast-growing perennial vine with climbing or trailing stems, *Passiflora incarnata* is also known as maypop, purple passionflower, real passionflower, wild apricot, and wild passion vine. Passion flower is used by people to treat anxiety, mostly before surgery. For a variety of problems, including pain, ADHD, sleeplessness, and stress, some people also use passion flower. However, there isn't any reliable scientific data to back up these uses. Passion flower is used as a flavoring in several dishes and reliable scientific data to backup these uses. Passion flower extricates Benn characterized into a few classifications of synthetic exercise like an anxiolytic, spasmolytic, sleep – inducing, calming, and opiate. These concentrates are a piece of a treatment that has effectively treated outpatients with change issues been found to contain beta carboline harmala alkaloids with stimulant properties.

The flower and natural product have just hinted of this synthetic substance, yet the leaves and the roots are regularly increasingly powerful and have been utilized to upgrade the impact of psyche changing medication. When dried, the leaves can likewise be smoked.

Passiflora quadrangular is utilized by conventional healers for snakebites. Snakebites causes blood thickening and, in the end, burst veins around the nibble: this is known as hemorrhaging.

A literature survey carried out in the Web of Sciences database, for the period of 2000 -2022 identified a total of 2058 publications related with *Passiflora* genus (Figure 1). During this period, research interest in the genus *Passiflora* increased, with a 6.9-fold increase in the number of publications per year.

According to this survey, the most studied *Passiflora* species is *P. delis f. flavicarpa*, *P. balata*, *P. incarnata* and *P. delis f. delis A* side from *P. incarnata*, which is historically known to be used as an herbal medicine for Relieving anxiety, insomnia or hypertension, the remaining species correspond too commercially species appreciated for their fruits typically consumed in fresh.

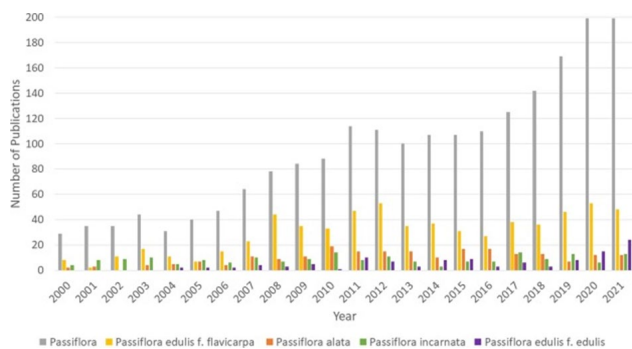


Fig.1. Publications related with Passiflora genus

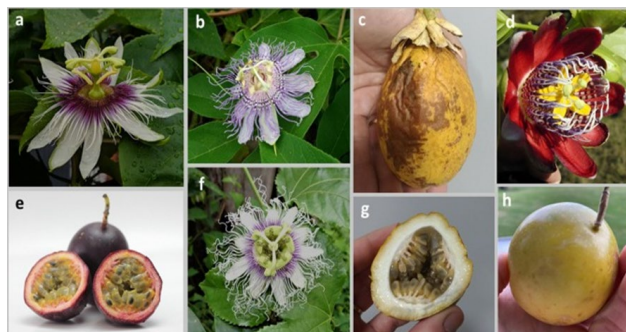


Fig.2. Characteristic flowers and fruits from the largely studied species of Passiflora plants: P.edulis f. flavicarpa (a) (h); P. alata (d) (c) (g); P. incarnata (b); and P. edulis f. edulis (f) (e).

A long history of medicinal use is code associated with different parts of Passiflora species plants. This is supported by the fact that 18.7% of the publications found in the literature survey (corresponding to 385 studies) belong to the categories "Pharmacology", "Chemistry Medicinal" and "Integrative Complementary Medicine". Nowadays, those species are widely used in traditional medicine as sedatives and anxiolytics (Dhawan et al., 2004). However, many other biological activities have been reported, such as anti-inflammatory, antioxidant, gastro protective, antibacterial, analgesic, anti-diarrheal, anti-diabetic and anti-proliferative, which are definitely related to their specific bioactive composition (Asaduzzaman et al., 2014; Carraz et al., 2015; Ferreres et al., 2007; Gupta et al., 2012; Montanher et al., 2007; Siebra et al., 2018; Taiwe & Kuete, 2017 Wasicky et al., 2015).

2. Origin And Taxonomy

Even though passion flowers were pre known by natives of North and South America, Europeans only found them after the discovery of the Americas and during the Spanish colonial period in South America. The first known reference to the plant passiflora dates form 1553 and is attributed to pedro Cieza de Leon (Bernacci 2008; Yokteng R. et al., 2011). Since then, descriptions of passion flower were closely linked to the belief that their morphology described the crucifixion of Christ. This symbolism became so planted at the time that led Linnaeus to adopt Passiflora (passio meaning "suffering" and flora meaning

"flower") as the definitive name for the genus in 1753 when he put the foundations for the botanical nomenclature (Bernacci et al., 2008).

Nowadays, Passifloraceae family, to which Passiflora genus belongs, is usually reported as containing between 500 and 700 species (Cerqueira-Silva et al.2005; Rodriguez-Amaya, 2012; Zerbini et al., 2008). However, the worldwide Biodiversity Information Facility (GBIF), the largest online database of biological data, indicates the existence of 1407 species belonging to this family (Passifloraceae in GBIF Secretariat, 2021). Lack of concurrence on the number of Passifloraceae species is usually attributed to taxonomic uncertainties, the use of synonyms, and ongoing delineation of new category (Cerqueira-Silva et al., 2014; Muschner et al.,2006). Besides, the number of genera is also a matter of debate, varying between 18 and 23(Corrêa et al., 2016). Despite this separation, it is clear that Passiflora is by far, the most important and diverse genus of Passifloraceae (Feuillet & MacDougal, 2007). Passiflora taxonomic hierarchy is rather complex as it's infra generic classification is divided into subgenus, super sections, sections and series, and in some cases, an infra specific classification is also required (Feuillet & MacDougal, 2003). Even though being an active area of research, nowadays, the infra generic classification of Passiflora genus suggested by Feuillet and MacDougal in 2004 into four subgenera (Astropheia, Deidamioides, Decaloba and Passiflora) is commonly accepted although this classification system is purely based on morphological and ecological characteristics, later studies on phylogenetic methodical using molecular markers and sequencing techniques, have partially corroborated this classification (Feuillet & MacDougal, 2003; Muschner et al., 2003, 2012).

3. Purple Passion Flower Geographical Distribution and Morphology

The universal morphology of Pssiflora genus has been extensively reviewed. Plant of the genus Passiflora are shrub and herbs mostly clombers with auxiliary tendrils. Leaves alternate, sometimes compound imparipinnate: stipules germinate at the base of petiole's, rarely absent: tendril axillary, arising from sterile product (Dhawan ET. Al. 2004). The flower open around midly that is generally the warmest time of day until the end of the afternoon and during these period pollinators, when colleting nectar, transfer pollen from one flower to another (Souza et. al. 2004). The vast receptacle is often hollowed out like a cup or basin, and bears numerous filamentous or ring-shaped appendages between the corolla and stamens, which may be brightly coloured and form a conspicuous corona of great diversity. Calyx bears 3-5 free or basely connate, imbricate sepals. Stamens 3-5 (10) inserted either at the bottom of the perianth, or at the base or top of gynophore; filaments subulate or thread like, free or mono adelphous and sheathing the gynophore; anthers versatile, introrse, two-celled, dissolution longitudinal. Ovary superior, unilocular, of 3-5 united carpels containing several or many

anatropous ovules on parietal placentas. Styles equal in number to the placentas, cohering at the base, distinct at the top, spreading, simple or branched, or 3–5 separate styles; stigmas clavate or peltate, some-times sub-two-lobed; ovule numerous, anatropous, 1–2 seriate, attached to 3–5 parietal linear placentas by longer or shorter funicles, enlarged into a cupule at the umbilicus. After its discovery passion fruit spread rapidly to Europe and elsewhere, and, by the end of the nineteenth century, it was widely distributed throughout many tropical and subtropical regions of both the New and Old World (Carr, 2014). Nowadays, even though the passion flower species are dispensed across the globe, the pan tropical region of the Americas still holds the higher large quantity and diversity, with Brazil and Colombia being particularly rich with an estimate of 150 and 170 species, respectively (Bernacci et al., 2015; Feuillet & MacDougal, 2007; Ocampo et al., 2010). The flower is also cultivated in Maharashtra and Punjab.

4. Mythological Conviction

This flower is also referred to as the Mahabharata Flower or Krishna Kamal in India. This lovely purple blossom contains the entire "Mahabharata" epic's narrative. Every aspect of the flower is just different and lovely, including the colour, shape, aroma, and leaves each of the 100 Kauravas is symbolized by one of the about 100 purple petals. Each of the five yellow petals in the centre stands for one of the Pandavas. The queen of the five Pandavas, Draupadi is symbolized by the green light bulb in the centre. The sacred trinity of the three major gods, Brahma, Vishnu, and Shiva, is symbolized by the three strands. The Sudarshanchakra, Lord Vishnu's sacred weapon, is the radial in the centre. Of the 10 manifestations of Lord Vishnu, Lord Krishna. (Shown in fig no 3 and 4) Significant is attached to Krishna Kamal in both Christianity and Hinduism.



Fig.3. Brahma, Vishnu, and Shiva, is symbolized by the three strands



Fig.4. five yellow petals in the centre stands for one of the Pandavas.

5. Methods And Preparation

- After the first flowers were collected, they were cut with scissors and then place in glass container.
- Ethanol was then added and the jar was lidded and mixture was shaken. Latter it was kept aside. And then the mixture was stirred daily for four weeks.
- After about four weeks, the mixture turned purple. And that mixture is used to reduce anxiety, insomnia and high blood pressure.



Fig.5. First flowers were collected



Fig.6. Glass container with Ethanol and flowers

6. Phytoconstituents

Flavonoids, Alkaloids, Phenolic compounds are known in the genus, Literature survey has revealed that a number of reports are available on *Passiflora incarnata*.

A. Flavonoids

Form the previous review articles we read, it is noted that apigenin is used as an anti-inflammatory related to type COX 1 and type COX 2 inhibitors. Flavonoids are chemical phenyl benzopyrones, which, us conjugated with sugars, are present in all vascular plants. Flavonoids are reported to be the major

phyto-constituents of *P. incarnata*. It contains mainly C-glycosyl flavones based on apigenin and luteolin. Several flavonoids have been isolated from *P. incarnata*. L. chrysin and apigenin along with orientin, isoorientin, vietexin, and isovitexin (Soulimani et al., 1997). The greatest concentration of *P. incarnata* flavonoids were found in the leaves between the pre – flowering and flowering stage of the plant (Menghini and Mancini, 1988). These all are show the anti-inflammatory activities. The anti-inflammatory activity of purple passion flower has been evaluated through its efficacy in the prevention of the loss of Trans epithelial electrical resistance (TEER) in Caco – 2 cells treated with on inflammatory cocktail (Carmona-Hernandez et al., 2019). Caco-2 cell models from human adenocarcinoma are commonly used to assess the worth of potential inhibitors of inflammation-induced intestinal barrier dysfunction. The maintenance of the intestinal barrier homeostasis is important to prevent bacterial translocation, outflow of pro-inflammatory compounds from the gut, and chronic inflammation (Hossen et al., 2020). It was demonstrated that a methanol PPF pulp extract was able to improve TEER results (83.7% and 59.5% for residues after extraction and lyophilized extract (0.10 mg.mL⁻¹), respectively. This effect was associated with phenolic compounds profile of the extract, with ferulic acid and epigallo catechins being suggested as the most effective inhibitors (Carmona-Hernandez et al., 2019). Further investigation is needed to determine the mechanism action improve Trans epithelial electrical resistances (TEER), although the inhibitory action of phenolic compounds on inflammatory routes related to COX – 1 and COX – 2. The Chrysin is a natural flavonoids compound obtained from the blue passion flower (*Passiflora caerulea*). Chrysin acts as an aromatase inhibitor supplement to bodybuilders and player. It has been shown to induce an anti-inflammatory effect, most likely by inhibition of COX-2 expression via IL-6 signalling (Woo et al., 2004).

B. Phenolic Compound

The phenolic compounds are the Ferulic acid, Gallic acid, Rosmarinic acid, these are common hydroxyl ring and all treating inflammation effect by inducing autophagy and blocking (NLRP – 3) inflammasome activation.

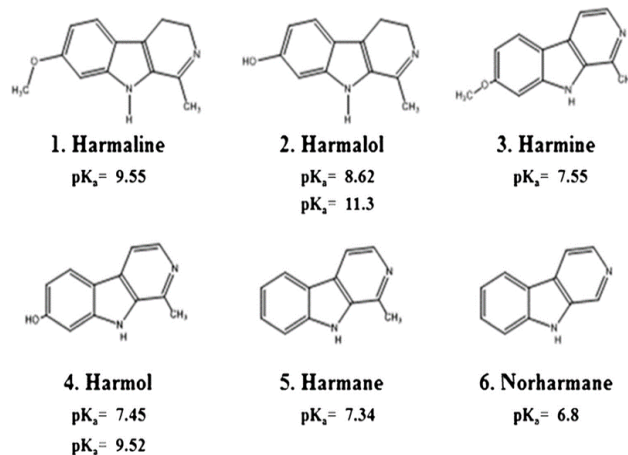
Inflammasomes are widely distributed cytosolic sensors which can sense metabolic imbalance or pathogen infection trigger the release of proinflammatory cytokines. The one of the most cells studied inflammasomes is NOD like receptor (NLRP 3).

C. Alkaloids

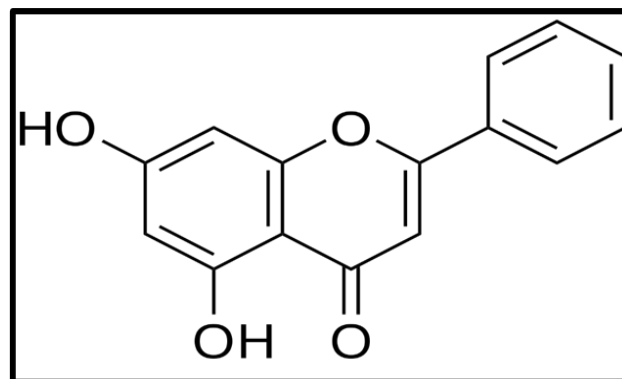
P. incarnata contains simple indole alkaloids based on beta carboline ring system it means harman, harmol, harmine, harmalol and harmaline. Content of harman and harmine, determined by direct spectro fluorimetric methods on TLC plates, and has been reported to be 10–20 µg/100 ml in the medicinal fluid extract of *P. incarnata*. Recently, all types of beta carboline alkaloids have been analyzed quantitatively by

HPLC with selective fluorometric detection (23). The

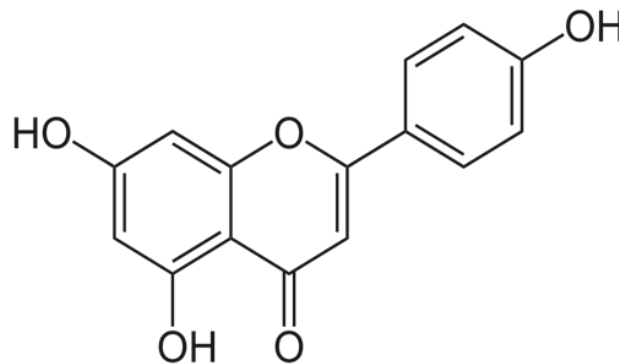
vegetative part of greenhouse grown *P. incarnata* contain 0.012 and 0.007% of harman and harmine, respectively, while the content of these alkaloids in the plant grown in fields has been reported as 0.005% and nil, respectively (24-26). Harmine, a fluorescent harmala alkaloid, can reversibly inhibit MAO A. Meanwhile, it showed anti-inflammatory activity by significantly inhibiting the NF-κB signalling pathway (Liu et al., 2017; Li et al., 2018).



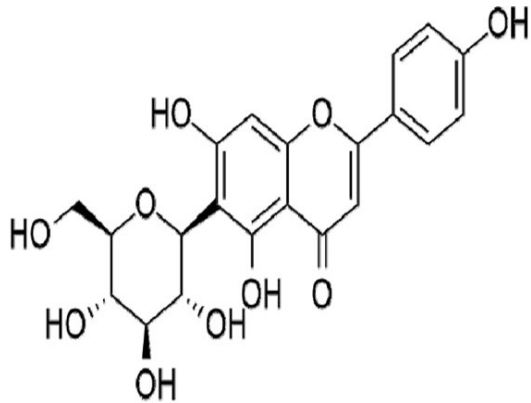
Alkaloids compound



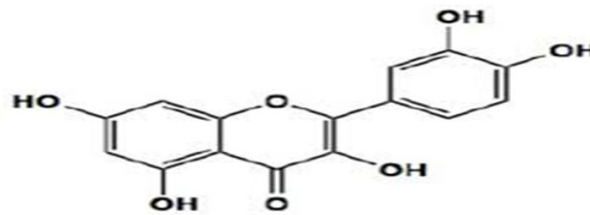
Chrysin



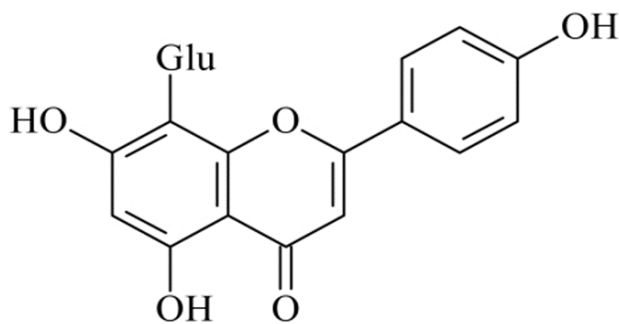
Apigenin



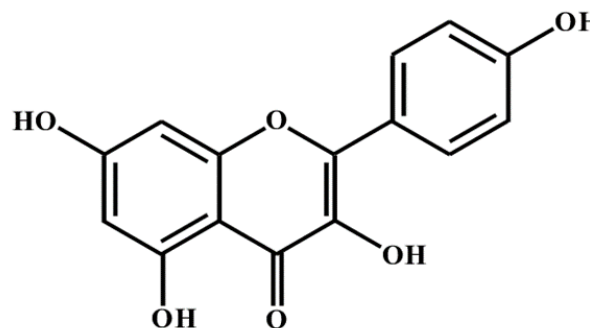
Isovetexin



Quercetin



Vetexin



Kaempferol

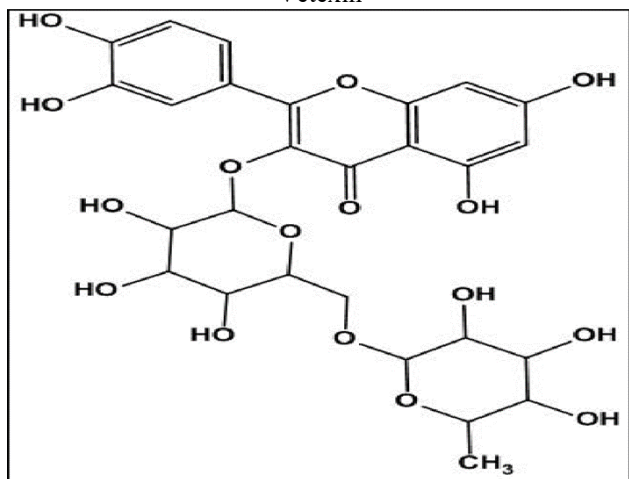
7. Pharmacological Aspect

A. Cannabinoids Reversal

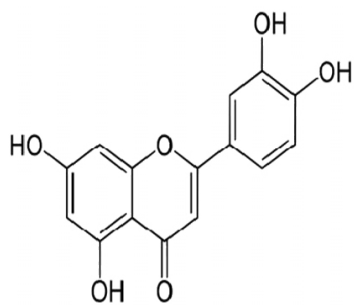
The recently reported benzoflavone (BZF) moiety from the plant *P. incarnata* (Linn) was analysed base reports on the utilization of this plant in separating cannabis fixation. In the cutting edge or allopathic arrangement of therapeutics, there has been no appropriate solution for battle the serious withdrawal impacts of different cannabis items, including marihuana, pot, bhang, hashish, ganja, and so on., the overall utilization of which has accomplished disturbing extents, particularly among the younger age. It has been accounted for that the BZF of *P. incarnata*, when managed simultaneously with cannabinoids, forestalled the advancement of resilience and reliance of cannabinoids in mice. Infact, even an intense organization of the BZF fundamentally obstructed the declaration of withdrawal impacts in cannabinoid reliance. So, these examine proposed that the BZF may have an advantageous job in cannabinoids inversion.

B. Alcohol withdrawal

A BZF moiety has been accounted for as of late to be answerable for the diverse CNS impacts of *P. incarnata* Linn. In the light of the setup handiness of the BZF moiety in checking the withdrawal impacts of substances like cannabinoids and nicotine by the creators, the bioactive BZF moiety has been tried in mice treated with an addictive portion of ethyl liquor to assess its adequacy in countering liquor reliance. The interminable organization of *P. incarnata* with alcohol would be wise to prevent impacts than the single intense treatment with *P. incarnata* in liquor sub ordinate mice. This result recommended that the treatment of *P. incarnata*



Rutin



Luteolin

concentrate could be utilized as a shady and elective medication for liquor withdrawal.

C. Opioids withdrawal

Opioids are a broad class of alkaloid compounds, including all natural and synthetic opioid peptides that have opium- or morphine-same activity. They may be classified into natural, semi-synthetic or synthetic compounds. The term opiate applies only to drugs obtain directly from opium, such as morphine and codeine. Passion flower is a woody, hairy, climbing vine, is reputed to has sedative/anxiolytic properties and has been used widely as an ingredient of herbal remedies, chiefly in the form of a liquid extract tincture. Accumulating evidence shows the efficacy of Passion flower (*Passiflora incarnata*) extract in the management of anxiety. The Commission E approved the internal use of passion flower for nervous restlessness and the British Herbal Compendium indicates its use for sleep disorders, restlessness, nervous stress and anxiety. A total of 65 male opiates addicts who fulfilled DSM IV criteria for opioid dependence and who gave consent to randomization to detoxification with either clonidine tablet plus passiflora extract (group 1) or clonidine tablet plus placebo drop (group 2) were entered into the 14-day double-bind controlled clinical trial. The mean \pm SD age for group 1 and 2 was 34.83 ± 7.6 and 35.92 ± 8.1 , properly (NS). Both groups were matched with respect to family history, education, economic status, marital status, years of dependency and interval.

since, the last attempt at giving up opiates. All subjects were outpatients who were admitted to the drug-dependency remedy unit. Fifteen subjects dropped out from the passiflora group and 20 from the placebo group over the trial, leaving 30 peoples (15 in each group) to completed the trial.

8. Conclusion

The therapeutic efficacy of *P. incarnata* extensively used in Indian System of Medicine has been established through modern testing and evaluation (pre-clinical and clinical trials) in different disease conditions. Species of *Passiflora* are normally found all through the world. These examinations place this indigenous medication as a novel possibility for bio-prospection and medication improvement for the treatment of such ailments as nervousness, sleep deprivation, anxiety. This review study about that the flower is used in anti-inflammatory related to the COX-2 inhibitor.

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