International Journal of Pharmaceutical Research and Development (IJPRD)
Platform for Pharmaceutical Researches & Ideas
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AN UPDATED ANALGESIC REVIEW ON MEDICINAL PLANTS-2011

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ABSTRACT

Due to having adverse side effects, like gastric lesions, caused by NSAIDs and tolerance and dependence induced by opiates, the use of these drugs as analgesic agents have not been successful in all the cases. Therefore, analgesic drugs lacking those effects are being searched all over the world as alternatives to NSAIDs and opiates. During this process, the investigation of the efficacy of plant-based drugs used in the traditional medicine have been paid great attention because they are cheap, have little side effects and according to WHO still about 80% of the world population rely mainly on plant based drugs. The aim of this review is to highlight the work on diuretics of plant origin. The present paper also involves various plant drugs and their bioactive extracts involved in analgesic mechanism. This article may help investigators to identify medicinal plants responsible for analgesic activity.

Key words: analgesics, traditional herbal medicines, plant drugs

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INTRODUCTION

India harbours about 15% out of the 20,000 medicinal plants of the world, of which 90% of them are found growing wild in different climatic conditions [1]. The tribal and rural populations of India largely depend on medicinal plants for their health care as well as for their livestock. This attracted the attention of several botanists that lead to an array of reports on ethnomedicine. Medicinal plants are the main sources of chemical substances with potential therapeutic effects. The use of medicinal plants for the treatment of many diseases is associated with folk medicine from different parts of the world. Naturally occurring compounds from plants, fungi and microbes are still used in pharmaceutical preparations in pure or extracted forms. A lot of compounds were characterized from plants. The research into plants with alleged folkloric use as pain relievers and anti-inflammatory agents is definitely a fruitful and logical research strategy in the search for new analgesic and anti-inflammatory drugs.

Pain & Pain Management: Pain can be defined as a somatic sensation of acute discomfort, a symptom

of some physical hurt or disorder, or even emotional distress. Pain is a crucial aspect of the body's defence mechanisms & it is a part of a rapid warning relay instruction the motor neurons of the central nervous system to minimize physical harm [2].

Pain can be classified into two types: a) Acute pain b) Chronic pain

Acute pain: Acute pain "is the body's warning of present damage to tissue or disease. It is often fast and sharp followed by aching pain**.** It is short-term pain or pain with easily identifiable causes.

Chronic Pain: Chronic pain is pain that last much longer than pain normally would with a particular injury. Chronic pain can be constant or intermittent and is generally harder to treat than acute pain. Pain can also be grouped by its source and related pain detecting neurons such as cutaneous pain, somatic pain, visceral pain, and neuropathic pain.

Causes of pain

Nocireceptors are pain receptors that are located outside the spinal column in the dorsal root ganglion and are named based upon their appearance at their sensory ends. These sensory endings look like the branches of small bushes. The perception of pain is when these receptors are stimulated and they transmit signal to the central nervous system via sensory neurons in the spinal cord.

Mechanism of action of Analgesics:

The analgesia system is mediated by 3 major components:

- The periaquaductal grey matter (in the midbrain)
- The nucleus raphe magnus (in the medulla)
- The pain inhibitory neurons within the dorsal horns of the spinal cord, which act to inhibit pain-transmitting neurons also located in the spinal dorsal horn.

Analgesic drugs which are currently in use are either narcotics or non narcotics which have proven side and toxic effects. To develop new synthetic compounds in this category is an expensive venture and again may have problems of side effects. On the contrary, many medicines of plant origin had been used and are in use successfully since long time without any serious effects. This review gives an idea about different medicinal plants used for analgesic activity.

Table 1: list of analgesic plants

Biological source	Family	Parts used	Solvent used	Chemical constituents	Screening method	References
Abelmoschus manihot Linn	Malvaceae	Leaves	Pet. ether, methanol	Anthocyanins, myrecetin, quercertin	Hot plate, tail immersion method	Jain pritam et al [3]
Abutilon indium Linn	Malvaceae	Whole plant	Pet. ether, ethanol, aqueous, chloroform	Saponins, flavonoids, phytosterols	Eddy's hot plate method	Saraswathi et al [4]
Alstonia scholaris Linn		Root	Methanol	Flavonoids, steroids, saponins	Acetic acid induced writhing, tail immersion method	Thankamani et al [5]

Alysicarpus monilifer Linn	Papilionaceae	Aerial parts	Methanol	Flavonoids, tannins, saponins	Tail flick, hot plate method	Kakrani et al [6]
Amaranthus spinosus Linn	Amarantaceae	Whole plant	Pet. ether, ethyl acetate, methanol	Saponins	Acetic acid incuced writhing ,radiant heat tail flick method	Sarker apu apurba et al [6]
Argyreria speciosa Linn	Convolvuceae	Roots	Ethanol	Flavonoids, steroids	Tail flick, writhing method	Varsha et al [7]
Azadirachta indica Juss	Meliaceae	Bark stem	Aqueous	Nimbin, nimbidin	Eddy's hot plate method, heat conduction method	Pravin et al [8]
Cleome viscose Linn	Capparaceae	Seeds	Hexane	Amino acids, fatty acids	Acetic acid induced writhing method, chick emetic model	Salman ahmed et al [9]
Clerodendrum phlomids Linn	Verbaneceae	Aerial parts	Ethyl acetate, methanol, pet. ether	Flavonoids, saponins	Acetic acid induced writhing-reflex method	Vijayamirtharaj et al [10]
Curcumas melo Var	Curcubitaceae	Seeds	Methanol	Alkaloids, tannins,	Acetic acid induced writhing and tail immersion method	Arora et al [11]
Anhydra fluctuans Roxb	Compositae	Aerial parts	Ethyl acetate, pet. ether	Flavonoids	Acetic acid induced writhing, hot plate method	Santanu sannigrahi et al [12]
Ficus arnottiana Miq	Moraceae	Leaves	Methanol	Alkaloids, flavonoids, glycosides	Acetic acid induced writhing, hot plate, heat conduction method	Saha rajesekhar et al [13]
Ficus Bengalensis Linn	Moraceae	Leaves	Chloroform, ethanol, aqueous	Sterols, flavonoids, triterpenoids	Hot plate, tail immersion method	Sachdev yadav et al [14]
Flemingia strobilifera R.Br	Fabaceae	Roots	Methanol	Chalkones, flavonoids	Tail immersion, tail flick intense method	Anil kumar et al [15]
Jatropha gossypifolia Linn	Euphorbiaceae	Leaves	Methanol	Flavonoids, saponins	Tail immersion method	Damor et al [16]
Kaempferia galangal Linn	Zingiberaceae	Rizomes	Ethanol	Carvone, eucalyptol	Cotton pellet granuloma method	Mohanbabu et al [17]

Manilkara zapota Linn	Sapotaceae	Leaves	Pet. ether, ethanol	Alkaloids, flavonoids	Hot plate method	Yogesh shivhare et al [18]
Marsilea trifolia Blanco	Marsileaceae	Leaves	Aqueous	Flavonoids, tannins, alkaloids	Hot plate, writhing method	Mohammad didar khan [19]
Mimusops elengi Linn	Sapotaceae	Leaves	Methanol	Flavonoids, poly phenolic compounds	Hot plate, writhing method	Karmakar et al [20]
Moringa concanensis nimmo	Moringaceae	Flowers	Ethanol	Flavonoids, alkaloids	Hot plate, tail immersion, tail flick method	Jayabharathi et al [21]
Nyctanthes arbor-tristis Linn	Oleaceae	Fruits	Ethanol	Glycosides	Tail flick, hot plate, acetic acid induced writhing method	Tripathi et al [22]
Phyllantus lawii Linn	Euphorbaceae	Aerial parts	Methanol	Pentacyclic, triterpenoids	Hot plate, acetic acid induced writhing method	Kodangala subraya.chandrashekar et al [23]
Piper longum Linn	Piperaceae	Leaves	Methanol	Amide alkaloids, flavonoids	Acetic acid induced writhing method	Al mamum et al [24]
Prosopis cineraria Linn	Leguminosae	Roots	Ethanol	Alkaloids, tannins	Hot plate, tail immersion method	Arvind kumar et al [25]
Psidium guajava Linn	Myrtaceae	Leaves	Chloroform, methanol & Pet. ether	Flavonoids, carotenoids	Acetic acid induced writhing method	Sarkar et al [26]
Pterocarpus erinaceus Poir	Fabaceae	Stem bark	Aqueous	Tannins, saponins, flavonoids	Acetic acid induced writhing method, formalin test	Ouedraogo et al [27]
Rhynchosia capitata DC	Fabaceae	Aerial parts	Methanol	Alkaloids, tannins, saponins	Acetic acid induced writhing, hot plate, tail flick method	Chaturvedi et al [28]
Rhynchostylis retusa Linn	Orchidaceae	Leaves	Methanol	Flavonoids, tannins, sterols	Acetic acid induced writhing method	Hossain et al [30]
Salvia wiedemannii Boiss	Lamiaceae	Aerial parts	Chloroform	Flavonoids, carotenoids, sterols	Acetic acid induced writhing, tail flick method	Ustun sezik et al [31]

Solanum trilobatum Linn	Solanaceae	Roots	Methanol	Alkaloids, saponins	Acetic acid induced writhing, hot plate, cotton pellet method	Pandurangan et al [32]
Sphearanthus indicus Linn	Asteraceae	Roots	Alcohol	Flavonoids, tannins, steroids	Tail flick, writhing method	Varsha et al [33]
Stephania japonica Thunb	Menispermaceae	Leaves	Methanol	Flavonoids, phenolics, tannins	Acetic acid induced writhing method	Islam et al [34]
Strophanthus sarmentosus P.DC	Apocynaceae	Roots	Ethanol	Glycosides, tannins, saponins	Hot plate, Writhing method	Agbaje, Ajidahun [35]
Tecoma stans Linn	Bignoniaceae	Leaves	Diethyl ether, ethanol	Flavonoids, tannins, quinones	Acetic acid induced writhing method	Dash et al [36]
Tectona grandis Linn	Verbenaceae	Flowers	Methanol	Tannins, phenolic compounds	Hot plate, writhing method	Ramachandran et al [37]
Terminalia arjuna Linn	Combretaceae	Stem bark	Ethanol	Alkaloids, tannins, flavonoids, saponins	Formalin test, hot plate, writhing method	Islam et al [38]
Tridax procumbens Linn	Compositae	Leaves	Aqueous, ethanol	Flavonoids, alkaloids, saponins	Acetic acid induced writhing method	Prabhu et al [39]
Vernonia amygdalina Del	Asteraceae	Leaves	Ethanol	Flavonoids, sterols, tannins	Acetic acid induced writhing method	Ibrahim et al [40]
Viola odorata Linn	Violaceae	Aerial parts	Methanol, aqueous	Tannins, alkaloids	Tail immersion, hot plate method	Anil et al [41]
Wattakaka volubilis Linn	Asclepiadaceae	Leaves	Methanol: water (1:1)	Saponins	Writhing, tail flick, cotton pellet granuloma method	Nandi et al [42]

CONCLUSION

Traditional systems of medicine are popular in developing countries and upto 80% of population relies on traditional medicines or folk remedies for their primary health care needs. Herbal medicines are in great demand in the developed as well as developing countries for primary health care because of their wide biological and medicinal activities, higher safety margins and lesser costs.

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