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A REVIEW ON ANALGESIC EFFECT OF PLANT EXTRACTS

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ABSTRACT
Humans suffer with pain due to both unpleasant and intolerable discomfort. The insensibility to pain without any underlying reason that results in unconsciousness is known as an analgesic effect. Since medicinal herbs have been used for a long time to treat pain and discomfort,the kratom plant, which contains multiple active chemicals and has been proven to activate opioid receptors in the brain and spinal cord leading to pain relief, is one of the herbal plants that have been researched for its analgesic qualities. The analgesic benefits of kratom extracts have been shown in a number of animal studies; they can raise pain tolerance and decrease pain sensitivity. Curcuma Longa is a different herbal plant that has been examined and has analgesic properties that aid to alleviate pain. To sum up, plant extracts have potential analgesic effects and are a useful resource for the creation of fresh pain treatment techniques. In order to confirm their safety, effectiveness, and suitable therapeutic use, future research should concentrate on identifying the active ingredients, optimising extraction processes, and carrying out large-scale clinical studies.

KEYWORDS: Analgesic effect, Inflammation, Pain relief, Medicinal herbs, Opioid receptor, Pain tolerance, Pain tolerance, Pain sensitivity.

INTRODUCTION
Analgesics are medications that reduce or remove the pain that many medical illnesses cause. Opioids, which primarily affect the central nervous system, and nanopioids, which primarily affect the peripheral nervous system, are two categories of analgesics.[1] The most potent analgesics are opioids. Studies on volunteers who are not in pain reveal the respiratory depression that follows acute opioid usage. however when patients get proper, consistent dosages of opioids, the respiratory depression is minimized.[2] The current communication provides a comprehensive overview of plant analgesic action with a focus on plants from Brazil and other countries that operate on the central nervous system. There are documented 160 plants, distributed among 79 families.[3] Some analgesics work by combining separate (monomodal) and interaction mechanisms into a single medication. Duloxetine, milnacipran, venlafaxine, and the recently authorised tapentadol (mixed opioidergic and noradrenergic action) are examples of such "multimodal" analgesics.[4] Similar to how NSAIDs and paracetamol were given to the patient to ease pain. Ultimately, using these combinations restricts the drug dosages a patient can get.Similarly, taking codeine together with paracetamol provides greater pain relief but may also cause nausea, dizziness, vomiting, and constipation[5]. Gastrointestinal haemorrhage, ulceration, and gastritis are the most typical side effects with NSAIDs. The benefit of opioids is that they are more effective at greater dosages. The frequency of negative effects is modest, however sedative side effects are frequent. Opioids' short duration and poor oral absorption, which make repeated injections or IV infusions necessary for the majority of patients, are significant drawbacks.[6] One of the most common reasons people visit the emergency room is to get some relief from discomfort. Whether children with the same acute, painful illnesses got analgesic therapy comparable to that of adults will depend on a retrospective chart analysis. The records of 156 patients from the medical college of Pennsylvania ED and 112 paediatric patients from the Children's Hospital of Philadelphia ED were examined. All patients had second- or third-degree burns (49%), lower-extremity fractures (31%) or sickle cell crises (20%) that were causing severe discomfort.15% of patients required hospitalization.[7]

Plant with potential analgesic effect:

- **Curcuma longa:**

Nomenclature: Despite the preserved name curcuma.L (Zingiberaceae), C.longa L.
Biological source: India's most prized spice, turmeric, is made from the rhizomes of the Zingiberaceae family plant, Curcuma longa.[9]

Macroscopic /Microscopic:
Microscopic:
Roots: The adventitious root's TS has a circular contour it includes epiblema, cortex, pericycle, vascular tissue, pith
Rhizome's of regular to circular rhizomes includes epidermis, cortex, endodermis, pericycle, pith, vascular tissue
leaf: The isobilateral leaf of the plant exhibits vascular bundles, mesophyll, and epidermis.[10]

Macrscopic:
Externally yellowish to yellowish-brown with root scars and leaf base annulation, shattered surface orange to reddish brown, core cylinder twice the width of cortex, and rhizomes that are oval and mainly short branching and approximately 2 to 5 cm long and 1.8 cm wide that have perfume and flavor.[11]

Medicinal use:
The ability of turmeric's major ingredient, curcumin, to treat inflammation and pain as well as research on how effective it is as an analgesic and an anti-inflammatory.[12]

- **Chilli pepper:**

Nomenclature: Species of capsicum, including C. pubescens, C. chinense, C. frutescens, and C. annuumvar. annuum. A.[13]

Biological source: The solanaceae family member's dried, mature fruits, known as capsicum annum, are what make up a chilli.

Macroscopic/Microscopic:
Macroscopic;
It is typically oblong conical, measuring 10–20 mm length and 4–7 mm broad. The pericap is slender and orange to dark reddish in colour. Each of the two cells in the pericap contains 5 to 10 tiny, flattened white-yellowish seeds with a strong flavour and aroma.

Microscopic:
The outer epidermis is constructed of sabrectangular cells with mesocarp and tiny vascular bundles, as well as yellowish oil droplets and chromaphores. The pericarp of the transverse section is composed of 5-7 rows.[14]

Medicinal use:
Capsaicin improves pain alleviation when delivered intravenously, subcutaneously, or topically. Topically administered large doses of capsaicin reduce chronic pain. It possesses therapeutic agents that are efficient in treating mild discomfort.[15]

- **Ginger:**

Nomenclature: The rhizomes of zingiber officinale roscooe,a plant in the ginger family.

Biological source: The Zingiber officinale plant, which belongs to the Zingiberaceae family, is used to produce the spice ginger.[17]

Macroscopic/Microscopic:
It demonstrates the existence of structure including the cortex,a broad central cylinder, thin-walled endodermoidal layers,vascular bundles,dispersed starch granules,oil cells,and xylem arteries.[18]

Use as medicine: Two times, ginger extract and paracetamol were given to 260 individuals with OA of the knee who were experiencing moderate to severe pain.[19]

Gastrointestinal relief:
Ginger has a long history of success in reducing the symptoms of digestive disorders. it is helpful for nausea, vomiting, and motion sickness, and it lessens colon spasms and cramps.[20]

- **Hemp:**

Nomenclature: Cannabis sativa L., popularly known as marijuana or hemp, is a plant that humans utilise for material purposes and as a medicine.[21]
Biological source: Cannabis sativa L., a member of the cannabaceae family, is a dioecious plant.[22]

Macroscopic/Microscopic:
Macroscopic analysis:
Visual assessment and recording of the morphological and organoleptic properties of C. sativa fresh, matured leaves

Microscopic analysis:
A mature leaf is sliced or dissected together with the midrib and lamina as a thin slice with a blade, cleared with chloralhydrate, and transferred into glycerin water for examination. The midrib and lamina of the transverse section are studied under a microscope.[23]

Medicinal use:
Cannabis contains more than 100 distinct cannabinoids and has the ability to reduce pain by neuromodulating the ascending and descending pain pathways, protecting neurons, and reducing inflammation. Endocannabinoids have the power to regulate hunger, mood, pain, and muscle tone.[24]

- **White Willow:**

Nomenclature: Salicaceae is a broard family that includes willow (Genus salix) and poplars (Genus populous).[25]

Biological source: In Sweden, cropland is utilised to grow willow, which is then used in short-rotation forestry to create biomass for energy.[26]

Macroscopic and Microscopic:
Bark thickness is varying between 5 and 20mm and sapwood is yellowish white light pinkish and heartwood is raddish brown with thin wavy orange coloured line.[27]

Medicinal use: According to phytochemical characterization of bark extract,Salix alba(SA)also known as white willow,is a plant used in folk medicine for the treatment of acute and chronic inflammation, infection,pain, and fever. Salin is the plant's primary component.[28] An effective painkiller for humans, white willow barks also helps organic calves who are in discomfort.[29]

Commonly available plant found in northeast india used as analgesic:

Serial No.	Name of the plant available
1	Water cress (Nasturtuim officinale)[30]
2	Nongmangkha (Phlogacanthus jenkinsii)[31]
3	Indian trumpet tree (Oroxylum indicum)[32]
4	Aromatic ginger,sand ginger (k.galanga.L)[33]
5	Guava(psidium guajava L)[34]

CONCLUSION

The analgesic effect of plant extracts, such as kratom and Curcuma Longa, has been studied and shown to have potential in alleviating pain. These extracts contain active chemicals that can activate opioid receptors in the brain and spinal cord, leading to pain relief. Animal studies have demonstrated that these herbal plants can increase pain tolerance and reduce pain sensitivity. Further research and exploration are necessary to fully understand the mechanisms and efficacy of these plant extracts as analgesics. Nonetheless, their analgesic properties offer promising prospects for alternative pain management strategies

Fig: Plant with potential analgesic effect.

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