ABSTRACT
The various plants have a potential medicinal implication. Medicinal plants are considered as imperative therapeutic aid. Therapy of classical NSAIDs and the opioids in the management of inflammatory and pain stipulation are major problems. The conservative drug available in the marketplace treat inflammation and analgesia produces various side effects. For conquer this problems medicinal plants play a major role to alleviate many diseases related with inflammation and analgesia. These reviews try to make accessible an overview of reported analgesic and anti-inflammatory activities of plants with various screening models like Carrageenan induced paw edema, Cotton pellet granuloma method, Formaldehyde-induced paw edema models, Eddy’s hot plate method, Formalin test, Acetic acid induced writhing test, Tail flick method, etc and inducing agents.

KEYWORDS: Inflammation, Analgesia, Medicinal Plants.

INTRODUCTION
Inflammation is a contained defensive reaction of cells/tissues of the body to allergic or chemical irritation, injury etc. The symptoms that produced inflammation are pain, redness, heat, swelling and failure of function that result from dilation of the blood vessels leading to an increased supply of blood and increased intercellular spaces resulting in the movement of leukocytes, protein and fluids into the inflamed regions.

Inflammatory Phase
Inflammation may have beneficial effects such as the destruction of invading microorganisms and the walling-off of an abscess cavity to prevent spread of disease. Though, it may also produce disease; for example, an abscess in the brain would act as a space-occupying lesion compressing vital surrounding structures or fibrosis resulting from chronic inflammation may distort tissues and permanently alter their function. Inflammation is typically classified according to its time course as:

INDIAN MEDICINAL PLANTS AS A SOURCE OF ANTI-INFLAMMATORY AND ANALGESIC AGENTS
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• Acute inflammation - The initial and often transient series of tissue reactions to injury.
• Chronic inflammation - The successive and regularly prolonged tissue reactions following the initial response.\(^2\)

The two main types of inflammation are also characterized by differences in the cell types taking part in the inflammatory response.

1. **Acute Inflammation**

Acute inflammation is the preliminary tissue reaction to a wide range of injuries or insults and may last from a few hours to a small number of days. The acute inflammatory reaction is similar whatever the causative agent. The major causes of acute inflammation are:

• **Microbial infections** - One of the commonest causes of inflammation is microbial infection. Viruses escort to death of individual cells by intracellular multiplication. Bacteria release specific exotoxins (chemicals synthesized by them which specifically initiate inflammation) or endotoxins (which are associated with their cell walls). Additionally, a few organisms cause immunologically mediated inflammation through hypersensitivity reactions.

• **Hypersensitivity reactions** – A hypersensitivity reaction occurs when an altered state of immunological reaction causes unsuitable or excessive immune reaction which damages the tissues. The types of reaction are classify as Types I, II, III, & IV, other than all have chemical mediators related to those involved in inflammation.

• **Physical agents** - Tissue damage leading to inflammation may occur through physical trauma, uv & other ionizing radiation, burns, or excessive cooling ('frostbite').

• **Irritant and corrosive chemicals** - Corrosive chemicals (acids, alkalis, oxidizing agents) provoke inflammation through gross tissue spoil. Though, infecting agents may liberate specific chemical irritants which produce inflammation.

• **Tissue necrosis** - Death of tissues from lack of oxygen or nutrients resulting from inadequate blood flow is a potent inflammatory incentive. The boundary of a recent infarct often shows an acute inflammatory response.
• **Redness** – An acutely inflamed tissue appears red, for example, sunburn, cellulites due to bacterial infection or acute conjunctivitis. This is caused by dilation of tiny blood vessels within the damaged tissues.

2. **Chronic Inflammation**

The word 'chronic' applied to any process implies that the process has extended over a long interlude of time. This is generally in the case of chronic inflammation, but here the term 'chronic' takes on a much more precise meaning, in this type of cellular reaction differ from that seen in acute inflammation. Chronic inflammation possibly distinct as an inflammatory process in which plasma cells, lymphocytes and macrophages reponderate, and which is usually accompanied by the formation of granulated tissue, consequential in fibrosis. Chronic inflammation is generally primary, but does sporadically follow acute inflammation. The commonest appearances of chronic inflammation are:

- Chronic ulcer, such as a chronic peptic ulcer of the stomach with breach of the mucosa, a base lined by granulation tissue and with fibrous tissue extending through the muscle layers of the wall.
- Chronic swelling cavity- for example osteomyelitis
- Thickening of the wall of a hollow structure by fibrous tissue in the presence of a chronic inflammatory cell infiltrate.
- Granulomatous inflammation, possibly with caseous necrosis as in chronic fibroc caseous tuberculosis of the lung.
- Fibrosis, which may become the most prominent feature of the chronic inflammatory reaction when most of the chronic inflammatory cell infiltrate has subsided.³

![Fig 1: Pathway of Acute and Chronic Inflammation³](image-url)
### Table -1: Medicine plants used for Analgesic and Anti Inflammatory activity

<table>
<thead>
<tr>
<th>S.no</th>
<th>Plant name</th>
<th>Family</th>
<th>Plant part used</th>
<th>Ref. no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Dracaena cinnabari balf</em></td>
<td>Agavaceae</td>
<td>Balf resin (ethanolic extract)</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td><em>Ageratum conyzoides</em></td>
<td>Asteraceae</td>
<td>Leaves (ethanolic extract)</td>
<td>15,16</td>
</tr>
<tr>
<td>3</td>
<td><em>Melanthera scandens</em></td>
<td>Compositae</td>
<td>Leaves (ethanolic extract)</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td><em>Solanum trilobatum</em></td>
<td>Solanaceae</td>
<td>Root (methanolic extract)</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td><em>Zizyphus rugosa</em></td>
<td>Rhamnaceae</td>
<td>Root bark (extract of water, chloroform, ethyl acetate and methanol)</td>
<td>19</td>
</tr>
<tr>
<td>6</td>
<td><em>Anacardium occidentale</em></td>
<td>Anacardiaceae</td>
<td>Bark</td>
<td>20</td>
</tr>
<tr>
<td>7</td>
<td><em>Crossopteryx febrifuga</em></td>
<td>Rubiaceae</td>
<td>Leaves (methanolic extract)</td>
<td>21</td>
</tr>
<tr>
<td>8</td>
<td><em>Microtrichia perotitii</em></td>
<td>Asteraceae</td>
<td>Leaves (methanolic extract)</td>
<td>22</td>
</tr>
<tr>
<td>9</td>
<td><em>Anogeissus accuminata</em></td>
<td>Combretaceae</td>
<td>Leaves (methanolic extract)</td>
<td>23</td>
</tr>
<tr>
<td>10</td>
<td><em>Stereospermum kunthianum</em></td>
<td>Bignoniaceae</td>
<td>Leaves</td>
<td>24</td>
</tr>
<tr>
<td>11</td>
<td><em>Abutilon indicum</em></td>
<td>Malvaceae</td>
<td>Leaves (extract of methanolic, ethanolic, aq.chloroform and petroleum ether)</td>
<td>25</td>
</tr>
<tr>
<td>12</td>
<td><em>Oscillatoria willei</em></td>
<td>Oscillatoriaceae</td>
<td>Leaves (methanolic extract)</td>
<td>26</td>
</tr>
<tr>
<td>13</td>
<td><em>Phyllanthus emblica Linn</em></td>
<td>Euphorbiaceae</td>
<td>Fruit (water extract)</td>
<td>27</td>
</tr>
<tr>
<td>14</td>
<td><em>Azadirachta indica</em></td>
<td>Meliaceae</td>
<td>Leaves</td>
<td>28</td>
</tr>
</tbody>
</table>
CONCLUSION

Medicinal plants are the largest part imaginative source of medicinal substances natural supplements and pharmaceutical compounds. In this review article the various extracts of plants are found to have momentous analgesic and anti-inflammatory activity unconcerned types of study models (screening method). In addition these medicinal plants will continue to serve as reservoir for improvement of potent drug with less serious and severe adverse effects. The occurrence of inflammation and analgesia (pain) is increasing now day by day due to present living condition. For this reason this review articles reported the advantageous effect of medicinal plant.

REFERENCES


For Correspondence

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