



## Therapeutic Potential of *Spilanthes acmella* – A Dental Note

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### ABSTRACT

*Spilanthes acmella* (syn) *Acmella oleracea* is a common ornamental plant grown in Brazil. It is also known as eyeball plant due to its characteristic appearance of the flower head and also known as anti-toothache plant. This plant has many therapeutic uses in medicine and dentistry as it is used as a diuretic, for treatment of rheumatoid arthritis, for gastro intestinal disturbances, for treating malaria and fungal infections. This article reviews the botanical description and discusses the application of *Spilanthes acmella* in medicine and dentistry.

**Keywords:** *Spilanthes acmella*, *Acmella oleracea*, Anti toothache plant, medicinal properties.

### INTRODUCTION

Toothache, also known as *odontalgia*, refers to aching pain in and around the tooth. The etiology of toothache can be dental or non dental. Dental causes include pulpitis, periodontitis, erupting wisdom teeth, cracked tooth, and dry socket. The non dental causes include trigeminal neuralgia, atypical odontalgia and referred pain of angina pectoris.<sup>1</sup>

The most common cause of toothache is when the innermost layer of the tooth, the dental pulp becomes inflamed. The treatment of toothache is by removing the decayed part of the teeth and replacing it with a filling or removing the infected pulp and replacing it with a filling material, sometimes the treatment is by cleaning the debris around the teeth or by tooth removal.

Many decades ago, when the facilities of dentists were not available, our ancestors took to herbal remedies for relief from various types of ailments. Usage of plants for treating diseases dates to at least 60,000 years ago.<sup>2</sup> There are about 250,000 species of plants, of which 15% have been evaluated phytochemically.<sup>3</sup> Fabricant *et al* identified 122 compounds obtained from 94 species of plants, 80% of these compounds had a usage similar to the current use of the active ingredient of the plant.<sup>4</sup> The bioactive compounds obtained from plants show lesser amounts of toxicity and have a novel mechanism of action. Common home remedies for toothache are saltwater, cloves, alcohol, hydrogen peroxide, vanilla extracts, almond extracts, peppermint extract, tea tree oil, lime etc.<sup>5</sup>

There have been reports of many traditional plants being used for these purposes, one of them being *Spilanthes Acmella*. This article reviews the botanical description and the outline of therapeutic potential of *S.Acmella* in dentistry and medicine.

*Spilanthes acmella* is a common plant grown in Brazil. It is confined to India in Chhattisgarh and Jharkhand. This article reviews the therapeutic application of *Spilanthes acmella* in medicine and dentistry.

### Scientific Classification

Kingdom	: Plantae
Phylum	: Tracheophyta
Class	: Magnoliopsida
Order	: Asterales
Family	: <i>Asteraceae</i>
Subfamily	: <i>Mimosoideae</i>
Genus	: <i>Acmella</i>
Species	: <i>A. oleracea</i>

### Botanical Description

*Spilanthes* as a genus is composed of 60 species distributed in the tropics and the subtropics. This plant is widely distributed in the tropical and sub-tropical regions including America, North Australia, Africa, Malaya, Borneo, India and Sri Lanka. In India it is confined to South India, Chhattisgarh and Jharkhand.<sup>6</sup> It is an annual herb that grows up to 40-60 cm. The plant has yellow/red gumdrop shaped flowers. The leaves are arranged opposite to one another and are 2.5 to 5 cm long. It is commonly known as Toothache plant, *Paracress* or Eyeball plant. The name Eyeball plant should be obvious to anyone who is familiar with the plant's flowers, which are yellow and gradually turn to dark red in the center.<sup>7</sup>

### Bio active compounds

Phytochemicals are active components present in plants that have protective or disease preventive properties. The most common alkaloid present in *Spilanthes acmella* is called *Spilanthal*. More than 45 other compounds have

been isolated, the dominating ones being hexanol, tridecanone, germacrene, hexanol, caryophyllene and sequesterpenes.<sup>8</sup>



Figure 1: *Spilanthes Acmella* plant



Figure 2: Flower head of *S.acmella*

## MEDICINAL USES

### 1. Diuretic

Diuretics are compounds capable of increasing the urine output. Experiments on rats suggest that cold water extract of *Spilanthes acmella* acts as a loop diuretic.<sup>9</sup>

### 2. Scurvy

Scurvy refers to signs and symptoms caused by vitamin C deficiency. The flower heads of *Spilanthes acmella* are used to prevent scurvy and aid digestion.<sup>10</sup>

### 3. Anti Malarial

*Spilanthes sp* are used as traditional anti microbial in Africa. *Spilanthes acmella* contains Spilanthol which shows activity against *Plasmodium falciparum*.<sup>11</sup>

### 4. Rheumatism

Rheumatism is a disease occurring in the elderly due to wear and tear of the joints<sup>12</sup>. The entire plant can be used as a treatment for gout.

### 5. Gastrointestinal diseases

The roots of the plants are chewed to treat GIT disturbances.<sup>12</sup>

### 6. Cosmetic

It is a fast acting muscle relaxant and has an anti-wrinkle effect. Reduction of facial wrinkles leads to significant smoother skin.<sup>12</sup>

## 7. Other

It protects the individual from colds and flu. An extract of the leaves and flowers is traditionally used for the stomatitis, flu, cough, rabies diseases and tuberculosis, throat complaints, headache and fever.<sup>12</sup>

## DENTAL USE

### 1. Toothache

Traditionally, *Spilanthes acmella* is called as anti-toothache plant. The pungent flower heads of the plants were chewed by people as they deaden or numb the tooth pain, throat problems or paralysis of the tongue. The component responsible for this is *Spilanthol*.<sup>13</sup>

### 2. Local anaesthetic property

Local anesthesia is the loss of sensation in a circumscribed area of the body caused by depression of excitation in nerve endings or inhibition of the conduction process.<sup>14</sup> Studies by Chakraborty *et al* showed the local anesthetic property of *Spilanthes acmella* in rats in comparison with xylocaine.<sup>15</sup>

### 3. Dentifrice

Spilanthol has been incorporated in tooth pastes and mouth rinses. The objective is to provide a lasting fresh minty flavor; it also increases salivation, which improves appetite. The spilanthol present also has a mild anesthetic effect thus enabling people with toothache to brush comfortably.<sup>16</sup>

### 4. Anti bacterial

Noor Jahan *et al* demonstrated that the ethanolic extract of *Spilanthes acmella* showed antimicrobial activity against *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Streptococcus pyogenes*, *Enterococcus faecalis*, *Escherichia coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Proteus mirabilis*, *Salmonella typhi*, *Shigella dysenteriae* the extracts also showed activity against resistant bacteria harboring *Bla* gene.<sup>17</sup>

Agar dilution assay of *S.acmella* also shows activity against 27 strains of bacteria both gram positive and gram negative.<sup>18</sup>

### 5. Anti fungal

*S.Acmella* shows only minimal antifungal activity. However, they are proven to have activity against the fungi *Cryptococcus neoformans* and *Microsporum gypseum* which are common opportunistic pathogens in AIDS patient.<sup>19</sup>

### 6. Periodontitis

Periodontitis is due to inflammation of gums. Chewing on the flower heads and roots has shown to decrease gum inflammation and have been used in the treatment of periodontitis.<sup>20</sup>

## 7. Recurrent Aphthous Stomatitis

Recurrent aphthous stomatitis is a disease characterized by multiple ulcerations on the mucosal tissue. It is commonly precipitated by stress, hormonal changes in women, trauma and chemical irritants.<sup>21</sup> The leaves of *S.Acmella* have shown to be effective on treating recurrent aphthous stomatitis.<sup>22</sup>

### CONCLUSION

Thus we can see that *Spilanthes acmella* is an ornamental plant with high therapeutic benefits like diuretic, antifungal, treatment of rheumatoid arthritis, antimalarial etc. It also has many dental uses. It can be used to treat toothache, in the treatment of periodontitis and aphthous ulcers. The characteristic feature of this plant is that its flower head has a numbing effect which helps in treating toothache. Thus we can see that further experimentation and research is necessary for its incorporation into medicinal and oral health care products.

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