Think India Journal
ISSN: 0971-1260 Vol-22, Special Issue-31
National Conference ETDAB-2019
Held on 23th & 24th December 2019
Organized by: Deptt. of Botany, Deogiri College, Aurangabad, M.S

Review: Ethanobotanical properties of Turmeric in Maharashtra

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Abstract

Ethanobotany is a recent branch of Life science leading to various disciplines such as anthropology, archeology, botany, ecology, economics and medicine, religious, cultural and several other disciplines. Seeing the Indian history it is found that Ayurveda plays major role in our country, herbal drugs are found to used very popularly not only in India but worldwide it is accepted. Today Ayurveda and scientific investigations are going hand in hand and working for new achievements. Turmeric (*Curcuma longa* and *Curcuma aromatica* Salisb.) has been described in Ayurveda, as treatment inflammatory diseases and is referred by different names in different cultures, active principle called Curcumin or diferuloylmethane, a yellow pigment present in turmeric (curry powder) has been shown to exhibit numerous activities. Curcumin is the major component found in Turmeric and is interested area in between the researchers. The present study was aimed to review the ethanobotanical properties,phytochemical and pharmacological properties of turmeric plant. The most important part of turmeric is rhizome part widely used by different tribal communities. Turmeric exhibits biological actions, which include anti-inflammatory, anti-diabetic, analgesic, antibacterial, anti-fungal, anti-protozoal, anti-ulcer, hypocholesteremic activities also turmeric has shown anti-cancer effect induced mainly mediated through induction of apoptosis and many more medicinal values. Maharashtra state in India ranks sixth in area under turmeric cultivation. In Maharashtra Sangali, Satara, Hingoli, Nanded, Parbhani are the major turmeric growing districts. Sangli, a city of Maharashtra, is second only to Erode in size and importance as a production and trading site for turmeric.

Key words: *Ethanobotany , Ayurveda, Turmeric ,Curcumin, Rhizome, Medicinal.*

Introduction

India is the largest producer, consumer and exporter of turmeric in the world. Indian turmeric is considered to be the best in the world market because of its high curcumin content. India accounts for about 80 per cent of world turmeric production and 60 per cent of world exports. Major turmeric exporting countries are India, Thailand, Taiwan, and several other Southeast Asian, Central and Latin American countries. The major turmeric importing countries include Japan, Sri Lanka, Iran, UAE, US, UK and Ethiopia. Major turmeric producing states in India are the southern states of Telangana, Andhra Pradesh, Tamil Nadu and Karnataka, the eastern states of Orissa and West Bengal, and the western state of Maharashtra. In Telangana during the year 2018-19, area covered under turmeric was 47888 hectares as against 44956 hectares in the corresponding period of last year. Among major turmeric growing districts, Nizamabad has reported 13965 hectares acreage under turmeric as against 12800 hectares in last year. Jagtial has so far reported 13250 hectares as against 12378 hectares during last year and Warangal (Rural) has reported 5521 hectares of acreage compared to last year's 4250 hectares. The same in Andhra Pradesh was reported as 17914 hectares as compared to 14830 hectares in the corresponding period of last year. Turmeric production for 2019-20 is estimated at 532,353 MT (basis dry crop) compared to previous year's 476,771 MT (Agriwatch). The estimated turmeric production may go down further as Maharashtra standing crop is at very crucial stage.

Maharashtra state in India ranks sixth in area under turmeric cultivation. The area under crop was 11000 hectare with a production of 45000 tonnes and productivity of 4.09tonnes/hectare during 2015-16. In Maharashtra Sangali,Satara,Hingoli,Nanded,Parbhaniare the major turmeric growing districts.

Turmeric as plant

Turmeric (*Curcuma longa)* is an sweet-smelling plant of Zingiberaceae family which has great medicinal values and numerous uses. Turmeric is known as the "golden spice" also the "spice of life." Turmeric has strong linkages with the socio cultural life of the people of the India . This "earthy herb of the Sun" with the orange-yellow rhizome was regarded as the "herb of the Sun" by the people of the Vedic period. No wonder the ancients regarded turmeric as the *Aushadhi*, the healing herb, the most outstanding herb, the one herb above all others [Jager, P.D. (1997)]. Turmeric has at least 6000 years of documented history of its use as medicine and in many socio-religious practices. Turmeric is probably a native of South East Asia, where many related species of curcuma occur wildly, though turmeric itself is not known to occur in the wild.

It is intellect-promoting (Sayana), antidote for snake venom (Kausika Sutra), in cardiac complaints and jaundice (Atharvaveda samhita). Turmeric is indicated against a variety of health problems and pathological conditions and used traditionally by a large number of ethnic communities in a variety of conditions. Some of the properties are well documented and validated by pharmacological and clinical trials, while many remain to be validated Duke, J.A. (2003) . It was compiled that 114 biological properties of turmeric from the USDA database (Jager, P.D. 1997). In Chinese medicine, turmeric rhizomes and tubers (root tubers) are used for different purposes. Turmeric rhizome is said to be a "blood" and Qi (vital energy) stimulant, with analgesic properties(Chang, H.M., But, P.P. (1987) .

Processing of Turmeric

Before turmeric can be used, the turmeric rhizomes must be processed. Rhizomes are boiled or steamed to remove the raw odor, gelatinize the starch, and produce a more uniformly colored product. In the traditional Indian process, rhizomes were placed in pans or earthenware filled with water and then covered with leaves and a layer of cow dung. The ammonia in the cow dung reacted with the turmeric to give the final product. For hygienic reasons, this method has been discouraged. In present-day processing, rhizomes are placed in shallow pans in large iron vats containing 0.05–0.1% alkaline water (e.g., solution of sodium bicarbonate). The rhizomes are then boiled for between 40–45 minutes (in India) or 6 hours (in Hazare, Pakistan), depending on the variety. The rhizomes are removed from the water and dried in the sun immediately to prevent overcooking. The final moisture content should be between 8% and 10% (wet basis). When finger tapping of the rhizome produces a metallic sound, it is sufficiently dry. The dried rhizomes are polished to remove the rough surface. Sometimes, lead chromate is used to produce a better finish, but for obvious reasons this practice should be actively discouraged. The powder maintains its coloring properties indefinitely, although the flavor may diminish over time. Protecting the turmeric powder from sunlight retards the rate of deterioration.

Adoptogenic Curative Properties of Turmeric

Turmeric Contains Bioactive Compounds With Powerful Medicinal Properties

Turmeric is the spice that gives curry its yellow color. It has been used in India for thousands of years as a spice and medicinal herb .Recently, science has started to back up what Indians have known for a long time — it really does contain compounds with medicinal properties. These compounds are called curcuminoids, the most important of which is curcumin. Curcumin is the main active ingredient in turmeric. It has powerful anti-inflammatory effects and is a very strong antioxidant. However, the curcumin content of turmeric is not that high. It's around 3%, by weight. Most of the studies on this herb are using turmeric extracts that contain mostly curcumin itself, with dosages usually exceeding 1 gram per day. It would be very difficult to reach these levels just using the turmeric spice in your foods. Therefore, if you want to experience the full effects, you need to take a supplement that contains significant amounts of curcumin .Unfortunately, curcumin is poorly absorbed into the bloodstream. It helps to consume black pepper with it, which contains piperine, a natural substance that enhances the absorption of curcumin by 2,000%.The best curcumin supplements contain piperine, substantially increasing their effectiveness. Curcumin is also fat soluble, so it may be a good idea to take it with a fatty meal.

2. Curcumin Is a Natural Anti-Inflammatory Compound

Inflammation is incredibly important. It helps your body fight foreign invaders and also has a role in repairing damage. Without inflammation, pathogens like bacteria could easily take over your body and kill you. Although acute, short-term inflammation is beneficial, it can become a major problem when it becomes chronic and inappropriately attacks your body's own tissues. Scientists now believe that chronic, low-level inflammation plays a major role in almost every chronic, Western disease. This includes heart disease, cancer, metabolic syndrome, Alzheimer's and various degenerative conditions. Therefore, anything that can help fight chronic inflammation is of potential importance in preventing and even treating these diseases. Curcumin is strongly anti-inflammatory. In fact, it's so powerful that it matches the effectiveness of some anti-inflammatory drugs, without the side effects it blocks NF-kB, a molecule that travels into the nuclei of your cells and turns on genes related to inflammation. NF-kB is believed to play a major role in many chronic diseases without getting into the details (inflammation is extremely complicated), the key takeaway is that curcumin is a bioactive substance that fights inflammation at the molecular level.

3. Turmeric Dramatically Increases the Antioxidant Capacity of the Body

Oxidative damage is believed to be one of the mechanisms behind aging and many diseases. It involves free radicals, highly reactive molecules with unpaired electrons .Free radicals tend to react with important organic substances, such as fatty acids, proteins or DNA. The main reason antioxidants are so beneficial is that they protect your body from free radicals. Curcumin is a potent antioxidant that can neutralize free radicals due to its chemical structure. In addition, curcumin boosts the activity of your body's own antioxidant enzymes. In that way, curcumin delivers a one-two punch against free radicals. It blocks them directly, then stimulates your body's own antioxidant defenses.

4. Curcumin Boosts Brain-Derived Neurotrophic Factor, Linked to Improved Brain Function and a Lower Risk of Brain Diseases

Back in the day, it was believed that neurons weren't able to divide and multiply after early childhood. However, it's now known that this does happen. Neurons are capable of forming new connections, but in certain areas of the brain they can also multiply and increase in number.One of the main drivers of this process is brain-derived neurotrophic factor (BDNF), which is a type of growth hormone that functions in your brain .Many common brain disorders have been linked to decreased levels of this hormone, including depression and Alzheimer's disease. .Interestingly, curcumin can increase brain levels of BDNF.By doing this, it may be effective in delaying or even reversing many brain diseases and age-related decreases in brain function .

It may also improve memory and make you smarter, which seems logical given its effects on BDNF levels. However, controlled studies in people are needed to confirm.

5. Curcumin Should Lower Your Risk of Heart Disease

Heart disease is the number 1 cause of death in the world .Researchers have studied it for many decades and learned a lot about why it happens. Unsurprisingly, heart disease is incredibly complicated and various things contribute to it. Curcumin may help reverse many steps in the heart disease process. Perhaps the main benefit of curcumin when it comes to heart disease is improving the function of the endothelium, which is the lining of your blood vessels. It's well known that endothelial dysfunction is a major driver of heart disease and involves an inability of your endothelium to regulate blood pressure, blood clotting and various other factors. Several studies suggest that curcumin leads to improvements in endothelial function. One study found that it's as effective as exercise while another shows that it works as well as the drug Atorvastatin. In addition, curcumin reduces inflammation and oxidation (as discussed above), which play a role in heart disease as well. One study randomly assigned 121 people, who were undergoing coronary artery bypass surgery, either a placebo or 4 grams of curcumin per day, a few days before and after the surgery. The curcumin group had a 65% decreased risk of experiencing a heart attack in the hospital.

6. Turmeric Can Help Prevent (And Perhaps Even Treat) Cancer

Cancer is a terrible disease, characterized by uncontrolled cell growth. There are many different forms of cancer, which still have several things in common. Some of them appear to be affected by curcumin supplements .Curcumin has been studied as a beneficial herb in cancer treatment and been found to affect cancer growth, development and spread at the molecular level.

Studies have shown that it can contribute to the death of cancerous cells and reduce angiogenesis (growth of new blood vessels in tumors) and metastasis (spread of cancer) .Multiple studies indicate that curcumin can reduce the growth of cancerous cells in the laboratory and inhibit the growth of tumors in test animals. Whether high-dose curcumin (preferably with an absorption enhancer like piperine) can help treat cancer in humans has yet to be studied properly.

However, there is evidence that it may prevent cancer from occurring in the first place, especially cancers of the digestive system like colorectal cancer. In a 30-day study in 44 men with lesions in the colon that sometimes turn cancerous, 4 grams of curcumin per day reduced the number of lesions by 40%.Maybe curcumin will be used along with conventional cancer treatment one day. It's too early to say for sure, but it looks promising and is being intensively studied.

7. Curcumin May Be Useful in Preventing and Treating Alzheimer's Disease

Alzheimer's disease is the most common neurodegenerative disease in the world and a leading cause of dementia. Unfortunately, no good treatment is available for Alzheimer's yet. Therefore, preventing it from occurring in the first place is of utmost importance. There may be good news on the horizon because curcumin has been shown to cross the blood-brain barrier .

It's known that inflammation and oxidative damage play a role in Alzheimer's disease, and curcumin has beneficial effects on both. In addition, a key feature of Alzheimer's disease is a buildup of protein tangles called amyloid plaques. Studies show that curcumin can help clear these plaques. Whether curcumin can really slow down or even reverse the progression of Alzheimer's disease in people is currently unknown and needs to be studied properly.

8. Arthritis Patients Respond Very Well to Curcumin Supplements

Arthritis is a common problem in Western countries. There are several different types, most of which involve inflammation in the joints. Given that curcumin is a potent anti-inflammatory compound, it makes sense that it may help with arthritis. Several studies show this to be true. In a study in people with rheumatoid arthritis, curcumin was even more effective than an anti-inflammatory drug. Many other studies have looked at the effects of curcumin on arthritis and noted improvements in various symptoms.

9. Studies Show That Curcumin Has Incredible Benefits against Depression

Curcumin has shown some promise in treating depression. In a controlled trial, 60 people with depression were randomized into three groups .One group took Prozac, another group one gram of curcumin and the third group both Prozac and curcumin. After 6 weeks, curcumin had led to improvements that were similar to Prozac. The group that took both Prozac and curcumin fared best. According to this small study, curcumin is as effective as an antidepressant.

Depression is also linked to reduced levels of brain-derived neurotrophic factor (BDNF) and a shrinking hippocampus, a brain area with a role in learning and memory. Curcumin boosts BDNF levels, potentially reversing some of these changes. There is also some evidence that curcumin can boost the brain neurotransmitters serotonin and dopamine .

10. Curcumin May Help Delay Aging and Fight Age-Related Chronic Diseases

If curcumin can really help prevent heart disease, cancer and Alzheimer's, it would have obvious benefits for longevity. For this reason, curcumin has become very popular as an anti-aging supplement. But given that oxidation and inflammation are believed to play a role in aging, curcumin may have effects that go way beyond just preventing disease .

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