



# In-vitro Evaluation of Antifungal Activity of Plant Extracts Against Anthracnose of Tomato (*Lycopersicon esculentum* L.) Caused by *Colletotrichum coccides*.

Pathan N. B. and Sawant R.J.

Department of Botany, Muktanand College, Aurangabad.

## Abstract

In present Investigation the bio-control activity of plant extracts against *Colletotrichum coccides* was studied. The 13 plant species were evaluated in present investigation. The leaf extract of eleven plant species and bulb of two plant species were evaluated. Out of these all the plant species the in-vitro bio control activity of *Jatropha curcas* were recorded maximum followed by *Jasminum nervosum* > *Cynodon dactylon* > *Lantana camera* > *Euphorbia hirta* > *Euphorbia hirta* > *Parthenium hysterophrus* > *Ocimum sanctum* L. > *Bael*(*Aegle marmelos*) > *Murraya koenigii* > *Z.Officinales*(*Ginger*) > *Allium sativum* > *Azadiracta indica* > *Datura stramonium* at 100% concentration. whereas at 50 % concentration maximum bio-control activity against *Colletotrichum coccides*, was recorded in an order *Jatropha curcas* followed by *Jasminum nervosum* > *Cynodon dactylon* > *Euphorbia hirta* > *Parthenium hysterophrus* > *Lantana camera* > *Ocimum sanctum* L. > *Datura stramonium* > *Bael*(*Aegle marmelos*) > *Murrayakoenigii* > *Allium sativum* > *Z.Officinales*(*Ginger*) (*Allium sativum*L.)

**Key words:** Plant extracts, tomato, Bio-control,

## 1. Introduction

Tomato (*Lycopersicon esculentum* L.) is the second most popular and widely grown vegetable in the world after potato (Panthee and Chen 2010). A trend is set up for commercial cultivation of tomato (Chadhab 2008). The crop tomato is cultivated on large scale in the region of Maharashtra and also some parts of Marathwada. The production of this crop has tremendously increased due to its multifarious uses in raw, cooked and processed forms as soups, sauces, ketchups, preserves and pickles (Tiwari and Choudhary, 1986).

Tomato is rich in vitamins, Carbohydrates, proteins, fats and potassium (Talvaset *al.*, 2010) The association of phytopathogenic micro-organisms with all these varieties is perhaps as old as civilization. Among these

organisms, fungi hold a significant place and are important as the pathogens. These fungal pathogens incite various types of diseases on their host crops and cause heavy economic losses annually throughout the Marathwada region. It was also noticed that the tomato cultivation in Marathwada region received a setback due to various disease of common occurrence such as bacterial wilt, leaf curl and early blight disease and root knot nematode fungal complex, (Rajput and Wagh, 1995). Huge losses has forced to researchers for simple effective and economic methods to control post harvest diseases and other losses in tomatoes (Wilson and Wisniewski 1989).

For controlling the above diseases, the use of pesticides have increased greatly all over the world. It is only due to the misconception that, more use of pesticides will be directly proportional to the yield of crop, but only trace amount of pesticides is useful for the crop and rest add to increasing environmental pollution and infertility of soil. Considering all these aspect the investigation the present study based on the biological management using some plant species.

## 2.Objective:-

The main objective of this research work is to identify the best plant extract with a high level of inhibitory activity against Anthracnose of tomato and also is an important step in developing plant based pesticides which are eco-friendly for the management of fungi.

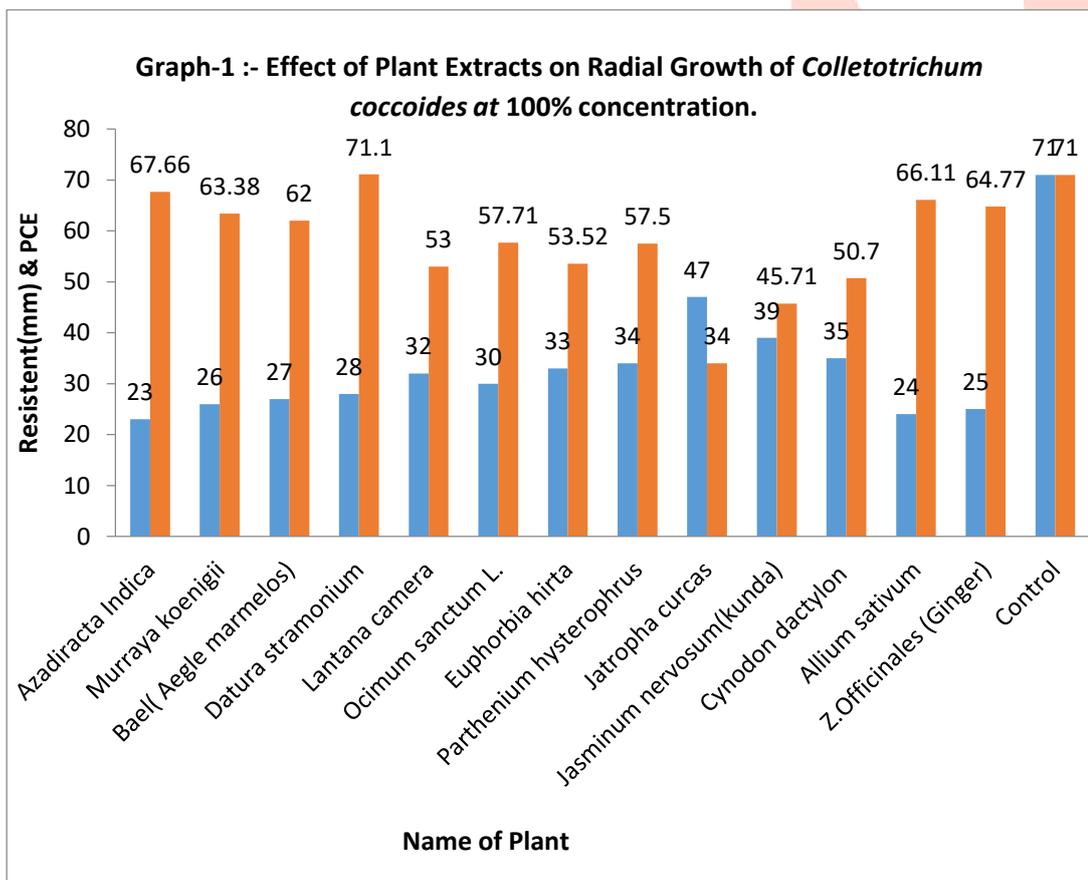
## 3. Material Method

The in vitro evaluation of plant extracts against pathogenic fungi *Colletotrichum coccoides* causing damage to tomato plant were conducted in Plant Pathology laboratory, Department of Botany, Muktanad College, Gangapur Dist. S. Sambhajinagar (MH) India . The aqueous extract of *Azadiracta indica*, *Murraya koenigii*, *Aeglem armelos*, *Datura metal*, *Lantana camera*, *Ocimums anctum*, *Euphorbia hirta*, *Amarathus retroflexus*, *Jatropha curcas*, *Jasminumner vosum*, *Parthenium hystero-phories*. Bulb extract of *Allium sativum* were used. Rhizome extracts of *Zingiber officinales* tested against the *Colletotrichum coccoids*. using mixer and grinder. It was filtered using four folded muslin cloth. The concentration was made as 50% and 100%. An antifungal activity of leaf extract of eleven plants species and extract of Rhizome and Bulb of two plants was studied by the food poisoning technique.

#### 4. Result table:

Table -1 :- Effect of Plant Extracts on Radial Growth of *Colletotrichum coccoides* at 100% and 50 % concentration.

Sr.No.	Botanical Name of plants	Resistant(mm) 100%	Resistant (mm) 50%
1	<i>Azadiracta indica</i>	67.66/12	63.23/13
2	<i>Murrayakoenigii</i>	63.38/9	60.29/10
3	<i>Bael(Aegle marmelos)</i>	62.00/8	58.82/8
4	<i>Datura stramonium</i>	71.10	57.33/9
5	<i>Lantana camera</i>	53.00/4	50.00/6
6	<i>Ocimum sanctum L.</i>	57.71/7	52.91/7
7	<i>Euphorbia hirta</i>	53.52/5	48.52/4
8	<i>Partheniumhysterophrus</i>	57.50/6	48.53/5
9	<i>Jatrophacurcas</i>	34.00/1	29.43/1
10	<i>Jasminum nervosum</i>	45.71/2	41.11/2
11	<i>Cynodon dactylon</i>	50.70/3	47.33/3
12	<i>Allium sativum</i>	66.11/11	63.22/12
13	<i>Z.Officinales(Ginger)</i>	64.77/10	61.77/11
14	Control	71.00	68.00



## 5. Result and Discussion:-

Many studies were carried out with respect to occurrences, causal organisms, severity, losses and pathogenicity. The present study showed that fungal pathogens are associated with tomato diseases. In present investigation, *Colletotrichum coccoides* are found to be major disease causing organisms. Tomato fruits were more prone to infection by fungal pathogens than bacteria and viruses. *Colletotrichum coccoides* appeared to be most active of all the pathogens that result losses of economic resources as well as mycotoxins. Control measures must be employed by vegetable growers, marketers and consumers at the time of harvesting, transportation, handling, storage and processing of tomato fruits.

Total 13 plant species were used for the present investigation, out of these leaf extract of eleven plant species were used and bulb of two plant species.

The plant extract *Jatropha curcas* were recorded maximum control followed by *Jasminum nervosum* > *Cynodon dactylon* > *Lantana camera* > *Euphorbia hirta* > *Euphorbia hirta* > *Parthenium hysterophrus* > *Ocimum sanctum L.* > *Bael(Aegle marmelos)* > *Murraya koenigii* > *Z.Officinales(Ginger)* > *Allium sativum* > *Azadiracta indica* > *Datura stramonium* at 100% concentration. Whereas at 50 % concentration maximum control was recorded in an order *Jatropha curcas* followed by *Jasminum nervosum* > *Cynodon dactylon* > *Euphorbia hirta* > *Parthenium hysterophrus* > *Lantana camera* > *Ocimum sanctum L.* > *Datura stramonium* > *Bael(Aegle marmelos)* > *Murraya koenigii* > *Allium sativum* > *Z.Officinales(Ginger)* (*Allium sativum*L.) recorded effective control of *Colletotrichum coccoides* . as compared to bulbs at 100% and 50 % concentration maximum control was recorded by bulb of *Allium sativum* followed by *Z.Officinales(Ginger)* at both concentration.

## 4. Acknowledgement:-

I would like to thanks principal, vice- principal, teaching and non teaching staff, Faculty of Botany Muktanand College Gangapur. Also Authors are thankful to Dr. S.R. Kale, Dr. B.N. Sonavne Dnyaneshwar Mahavidhyalaya Newasa and Dr. B.D. Takate Dept. Of Bio-fertilizer KVF Bhende Newasa Ahmednagar for their help and constant support during this investigation.

## 5. References.

1. **Chabda KI 2008.** Tomato Handbook of horticulture. Pub. By Indian council of Agriculture Research. 464-470.
2. **Bose TK, Som MG, Kabir J 1993.** Vegetable crop, *kalyani pub.*, 224-280.
3. **Panthee DR, Chen F 2010.** Genomics of fungal diseases resistance in tomato. *Current Genomics*. 11(1):30-39.
4. **Rajput JC, Wagh RB 1995.** Studies on microflora. *Crop research*; 13:231-233.

5. **Tiwari RN, Choudhary B. *solanaceaecrop* 1986:** Tomato vegetable crop in India, pp.248-290. Naya Prakash, Calcutta,.

6. **Talvas, J, Caris-veyrat, C, Guy L, Rambeau, M, Lyan B., Minet- Quinard, Lobaccaro, J.A, Vasson, M., George, S., and Mazur A. (2010).**

Differential effects of lycopene consumed in tomato paste and lycopene in the form of purified extract on target genes of cancer prostatic cells. *American Journal of Clinical nutrition*, 91: 1716-1724.

7. **Wilson, C.L. and Wisniewski, M.E.1989.** Biological control of postharvest diseases of fruits and vegetables: an emerging technology. *Annu. Rev. phytopathol.* 27: 425-441.

