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## An Investigative Study on the Leaf Spots of *Achyranthes aspera*.Linn.

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**ABSTRACT-** Plant leaves often offer a good harbour to both epiphytic and endophytic organisms. The present work investigated the association of leaves of *Achyranthes aspera*, Linn. Plants and a crape myrtle aphid. Leaves with circular rose-red patches (on the underside) were collected and examined thoroughly. The spots and subsequent curling of the leaves was resulted due to the harbouring of an endophytic aphid. The mites were isolated and sent for identification. The isolated aphid was identified as *Tinocallis kahaluokawalani* (Kirkaldy). The leaves are highly medicinal, but the aphids changed its anatomy and morphology.

**Key Words-** *Achyranthes aspera*, Crape Myrtle aphid, Patches, Hypertrophy, Anatomy.

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### I. INTRODUCTION

*Achyranthes aspera* Linn. is a plant belongs to family amaranthaceae. The plant is highly medicinal and posses' pharmacological activities like anti-allergic, nephroprotective, antiparasitic, analgesic and antipyretic. (A.Krishnaveni, S.R. Thaakur), (2006). The plant parts are used traditionally for gastric disorders. (Z.E. Selvanayagam, S.G. Gnanavendan et.al ;), (1994). Poor attention is received for the organisms that the plant parts harbour, either epiphytically or endophytically. The leaves of this plant show rose-red patches and appear to be abnormal. The critical studies on these patches revealed the association of whitefly on the under surface of the leaves.(R.W.A.Jesudasan, B.V.David), (1986). The morphology, anatomy and even the chemical constitution of such leaves changed due to this association. (N.S. Shekhawat, K.G.Ramawat), (1978). These insects and flies can increase abnormally the size of the organ that they harbour due to increased cell size. This hypertrophy can induce the formation of galls, curls etc. (A.Raman), (2007).

### II. METERIALS AND METHODS

#### Materials

Spotted Leaves of *Achyranthes aspera*. Linn.

Razors.

Glass Slides.

Safranine stain.

Fast Green Stain.

Ethyl alcohol

Xylene

DPX Mountant.

Needles.

Brushes.

Cavity Slids.

Glycerine.

Student Research microscope

Light microscope

### **Methods**

#### Histological Studies

1. Collected leaves were washed thoroughly and cleaned well.
2. Fine hand sections were made using sharp razors.
3. Sections were transferred to clean glass slides using fine brushes.
4. They were passed through double stain series using safranin and fast green.
5. Finally they were mounted permanently using DPX mountant.
6. They were subjected to microscopical studies.
7. The results were recorded by taking photographs.

#### Isolation of Aphid

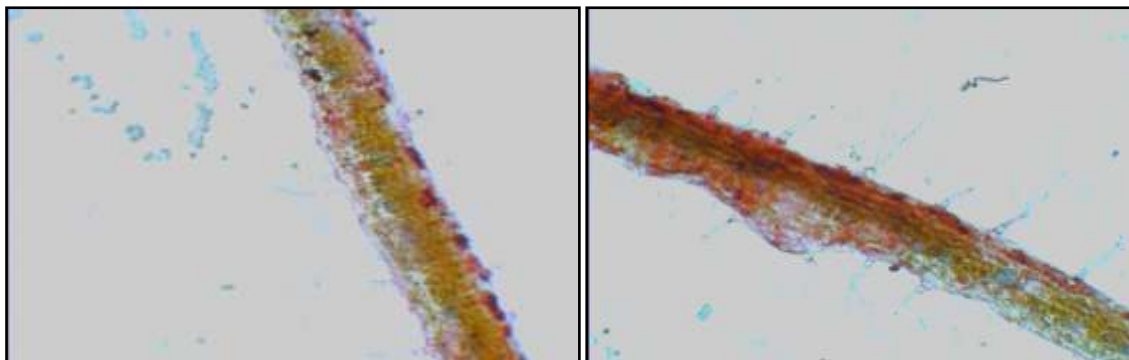
1. Collected leaves were washed thoroughly and cleaned well.
2. The spotted regions were teased carefully using needles.
3. The aphids were collected in cavity slides.
4. They were kept fresh with glycerin.
5. The slides were sent for identification
6. The results were recorded by taking photographs also.

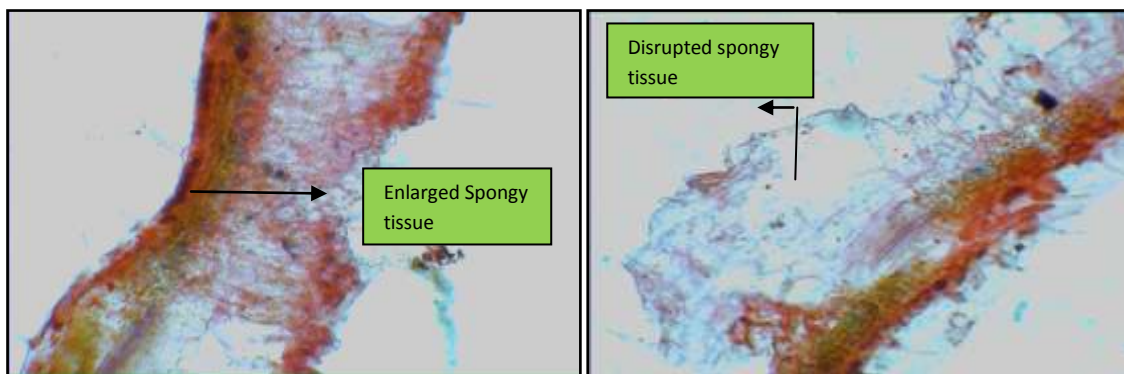
### **III. EXPERIMENTAL RESULTS**

#### **Normal and Spotted Plant Twigs**



**Histology –Stages of hypertrophy stage 1- 4**





Aphid



## DISSCUSION

The sections through spotted regions of the leaves showed upper epidermis and lower epidermis. Upper epidermis was followed by single layered palisade tissue. In some sections it was absent. The number of chloroplasts was a few or even absent in palisade layer. Palisade layer was followed by spongy tissue of 4-6 rows. The spongy region was highly parenchymatous which were thin walled. They appeared to be gradual increase in their size. The shape was highly irregular and completely devoid of chloroplasts. Glandular trichomes were observed. Vascular region was less differentiated in spotted areas.

The collected mites were sent for identification to Dr.Aneesh, Department Of Zoology, St.Joseph College, Irinjalakuda, Thrissur, Kerala. The identified organism was *Tinocallis Kahawaluokalani*.( Kirkaldy). It is commonly known as CrapeMyrtle Aphid. The aphid synonymously known as *Sarucallis Kahawaluokalani*. It has incomplete or gradual metamorphosis and the nymphal stages appear as small adults without wings. The aphid suppered the palisade layer and caused proliferate growth of thin walled spongy tissue. As its growth continued, the spots were extended to the leaf tips and finally resulted in leaf curling.

## CONCLUSIONS

The investigation revealed the interesting relationship with an aphid, *Tinocallis Kahawaluokalani*.and the leaves of *Achyranthes aspera*. Linn. The leaves are highly medicinal. But the harboring of aphid causes destruction of palisade tissue and affects photosynthetic rate. Enlargement of spongy layer resulted in increased cell size (Hypertrophy), which also affect leaf anatomy. The leaves are withered away pre maturely due to this association. The real Phytochemical and physiological impact has to be assessed in this regard.

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