

(2)

(1)

(1)

(1)
(2)

2009/03/03
2009/08/04

Medicago sativa L.var local

(

) *Phaseolus vulgaris* L.

TSP

H₂S O₃ NO_x SO₂

Medicago sativa L.var local :

Phaseolus vulgaris L

The Effect of Air Pollutants on Tissue Structure of Alfalfa and Bean

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ABSTRACT

Cultivars of *Medicago Sativa* L. var. local and *Phaseolus vulgaris* L. were planted in three locations, ten pots per location, the first location which is the most polluted one is (Bab Toma), second polluted one is (Jeser Victoria), and the reference location is (Daria), In the west of Damascus.

High and low temperature, and relative humidity were measured within planting months, and no significant differences appeared between the three locations.

Main pollutants SO₂, NO_x, O₃, H₂S, TSP were measured, high concentrations were found in Bab Toma then in Jeser Victoria.

Results showed that polluted air effected leaves tissue, so cells destroyed, protoplast gathered into a mass inside the cell, palisade and spongy parenchyma damaged, and distances between cells became wider.

As a result of that the physiological function of leaf is effected.

Key words: *Medicago sativa*, *Phaseolus vulgaris*, Air pollutants, Plant tissue.

H₂S

NO_x

O₃

Brian *et al.*, 1975, Mansfield 1976, Bell., 1986, Agrawal *et al.*, 1999]
.[2005 2001

[El-banna *et al.*, 1999]

.[2004

-Meslmani, 2000]

: .1

Air Quality in]
(3)

- (1) :
- (2) [Damascus 2000

.()

-

: .2

: Fabaceae

Medicago sativa L .var. local -

Phaseolus vulgaris L -

: .3

[1985] Inceptisol

Clay

4 :

/ 200 "Mocap"

.50 "Carbendazim"

: .4

Randomized Complete Block Design

35 : .5

20 33

0.13

1/2

.2003 20

6/17 7/28

.8/23

20 20

20 60

/ 0.42 - 0.13

/ 0.35 - 0.30

.2003 /05 /15

:
Hydrograph Thermograph

H2S : .7
AF21M SO2 CH2S
CO AC31M NO, NO2
.O₃41M O3 CO11M

Air Pollution Monitoring Station

Total .A-Environment S
High Volume Air Sampler Suspended Particulates TSP
. HVAS

: .8

Ultramicrotome

³ 100 1
(1)
³ 100 (1)

	³ 100
(Epoxy Resin) Epon 812	46
(Dodecenyl Succinic Anhydride) DD.S.A	30
(Nadic Methyl Anhydride) N.M.A	24
(Tri"Dimethyl Amino Methyl " Phenol) D.M.P-30	1.75

:
) %3Glutaraldehyde *
(2 × 1 *
15 Buffer *
(OsO₄) Osmium tetroxide *
() *

.%50 *
 . 15 %50 %3 *
 . 15 %75 *
 . 15 %95 *
 . 15 %100 *
 50/50 *
 *
 *
 . 45 *
 . 5 - 3 60 *
 Ultramicrotome *
 .(" PUR" Bleude Toluidine) *
 (BDH) *

(2)

(40)
 .[1987]

.2003 () (2)

9.5	22.5	11	23	11	23.5	
14.5	31.5	17	31.5	16.5	32.5	
17	33.5	19.5	33.5	18.5	34.5	
18	35.5	21.5	36.5	20	37	
18	37	21.5	37.5	20.5	37	
16	32.5	18	33	17.5	33.5	

: -
(3)

.2003

%

(3)

51.37	47.66	53.02	
34.09	31.48	36.14	
44.28	38.35	42.69	
38.15	40.47	47.71	
40.09	43.31	48.23	
36.93	41.45	48.15	

(4)

1.05 :SO₂

()

ppb 34.16 15.44

WHO] (ppb 19 -12)

SO₂

ppb 31.91 16.59 5 :

O₃ .[1987

[Agrawal *et al.*, 1999] (ppb 10)

70.01 41.75 12.54 :NO_x

.[Agrawal *et al.*, 1999] ppb 70 15

ppb 2.99 2.22 0.38 :

0.075 :CO

ppm 3.06 2.28

[Meslmani, 2000]

SO₂

[Bell, 1986]

SO₂

Spongy

mesophyll

.(6 5 4)
)
. (8)

(7

(6)

Upper epidermis

Lower epidermis

258.93

215.2 232.53

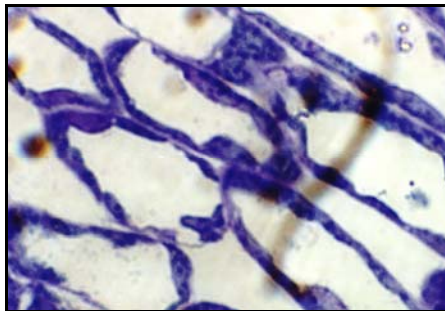
.()

(6)

258.93	100.8	122.93	15.2	20	
232.53	93.33	116	9.6	13.6	
215.2	94.4	98.93	9.06	12.8	

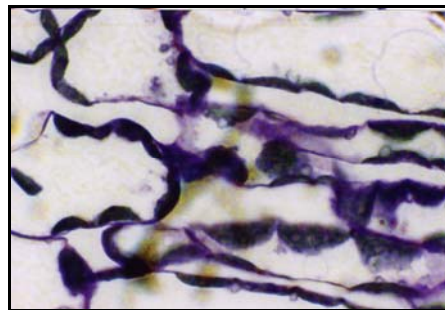
(1)

(1000×)

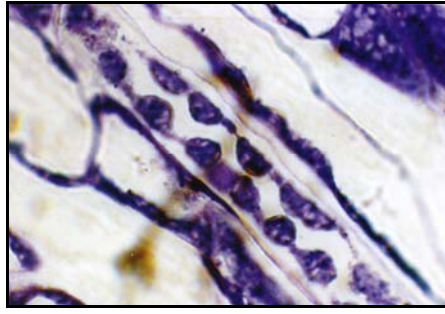


(2)

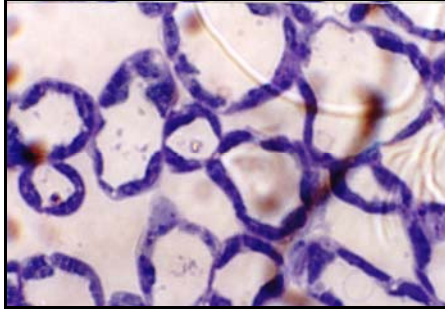
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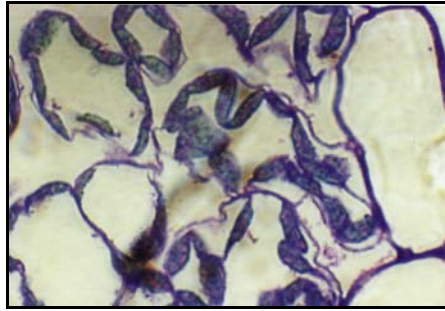
(3)
(1000×)



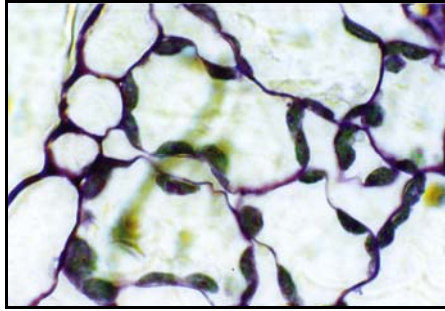
(4)
(1000×)



(5)
(1000×)

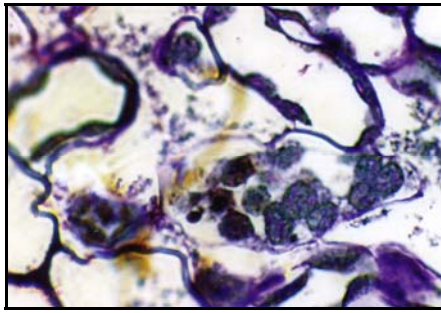


(6)
(1000×)



(1000×)

(7)



(8)



-

(9) 6 - 5

3-2

(11 10)

(12)

(13)

Spongy mesophyll
Palisade parenchyma

(15 14)

(16)

7

Lower epidermis

Upper epidermis

245.87

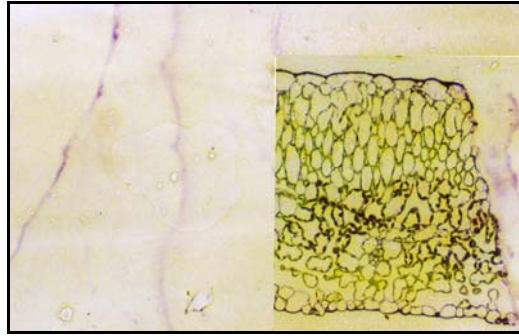
339.2

211.2

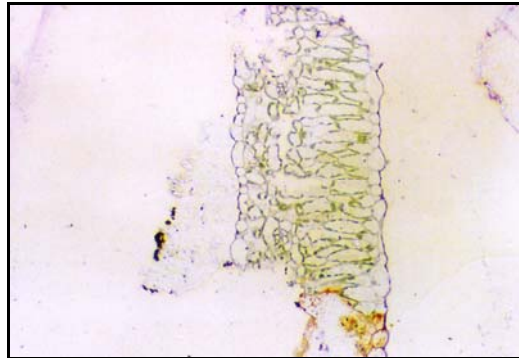
() (7)

339.2	151.2	148.8	16.53	22.67	
245.87	104.27	105.33	15.4	20.8	
211.2	95.2	84.26	13.87	17.87	

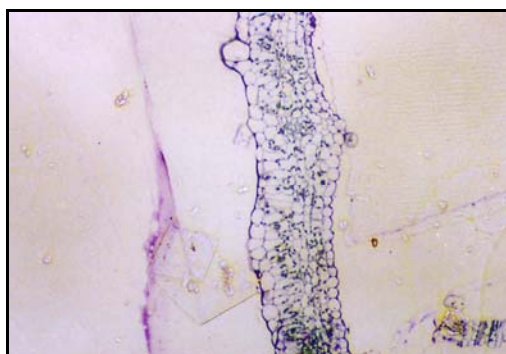
(9)
(100x)



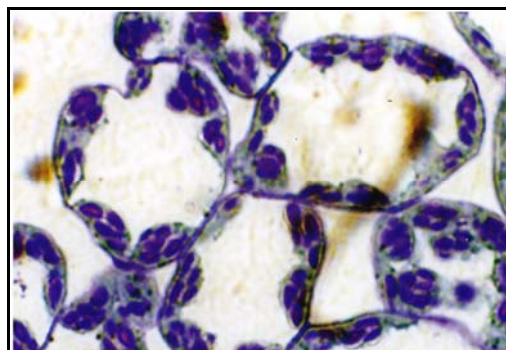
(10)
(100x)



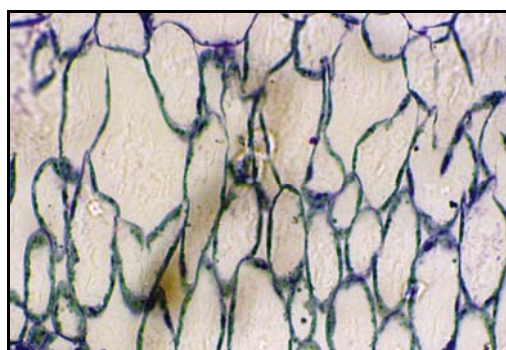
(11)
(100×)



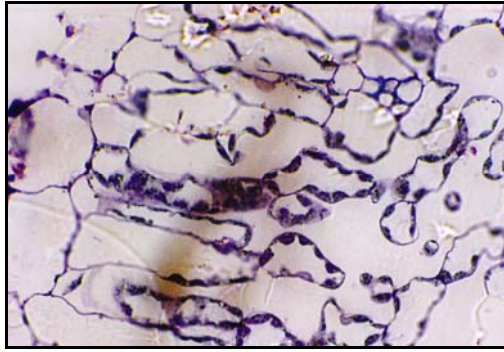
(12)
(1000×)



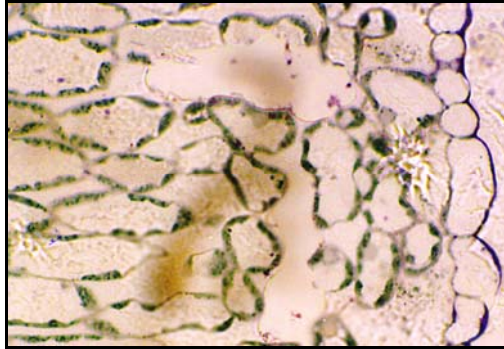
(13)
(400×)



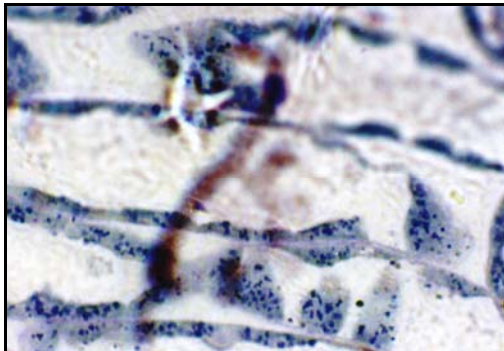
(14)
(400×)



(15)
(400×)



(16)
(1000×)



(40)
[1987]

[1987]
%5 %95

[Bell 1986] SO₂ °12- 4- SO₂

() ppb 34.16 15.44 1.05 SO₂
(ppb 19 -12)
ppb 31.91 16.59 5 [WHO 1987]

[Agrawal & Agrawal 1999, Olszyk et al 2002] (ppb10)
70.01 41.75 12.54 :NO_x

Agrawal &] ppb 70-15
ppb 2.99 2.22 0.38 : [Agrawal 1999

ppm 3.06 2.28 0.075 :CO

[Meslmani 2004]

SO₂ [Bell 1986]

ppb 88
ppb 19 -12

[Mansfield 1976, WHO 1987]

ppb 10

ppb 40

[Agrawal & Agrawal 1999]

ppb 68

[Agrawal & Agrawal

ppb 70 15

.1999 ,Pervanchon et al. 2002]

[2003

] (3 / 150)

2001

]

. [2004

CO₂

[2001

Brian & Kozlowski 1975, Bell 1986]

[El-banna *et al.*, 1999]

. [Bell 1986]

. [Odasz Albrigtsen *et al.*, 2000]

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