

Fusarium poae

/ /
(2018/ 11/1 2018/ 7 /8)

%16,9

% 27,5

.%21,5

% 25,8

Bipolaris sorokiniana *Fusarium poae* (Peck). *Wollenw. F.culmorum* (Wm.G. Smith) Sacc. *F. graminearium* (Schwabe) (Sacc.) Shomaker*F.poa*

(PC) Polymerase Chain Reaction

.PCR

Fusarium poae :

First Record of *Fusarium poae*, Wheat Root Rot Fungus in the North of Iraq

Ali K. AL-Taee**Zardasht A. Taha***Department of Plant Protection/ College of Agriculture and Forestry/ University of Mosul***ABSTRACT**

The Results of field survey conducted in Ninevah and Erbil governorates to assess the distribution of root rot disease in wheat have shown variability in infection levels. In Ninevah; the highest infestation of %27.5 was reported from Bashika, and lowest of %16.9 from Hamdaniyeh, and in Erbil; the highest infestation of %25.8 was reported in Grdy Mawan and lowest of %21.5 was in Khalwan. Isolates from root rot infected wheat plants shown the appearance of *Bipolaris sorokiniana* (Sacc.) Shomaker, *Fusarium graminearium* (Schwabe), *F. culmorum* (Wm. G. Smith) Sacc and and *F.poa* (Schwabe) as first found and recorded on wheat in Iraq, the fungus *B. sorokiniana* recorded the highest isolation rate of %54.1 in Tallafar and lowest rate of %37.1 in *Qapakian*, followed by *F.culmorum* which recorded a range of isolation between % 22.1 and %25.4. Identification of isolated fungi were confirmed by conducting Polymerase Chain Reaction (PCR) molecular test using 2 specific primers FP82F and FP82R. The expected PCR product (220 bp) obtained from a specific molecular marker (FP82), confirmed that they belong to fungus *F. Poae*. However, this is the first molecular study indicates clearly the presence of *F. Poae* in Iraq.

Keywords: *Fusarium poae* , wheat root rot, PCR.

Poaceae

Triticum aestivum L.

Fusarium culmorum

F.pseudo graminearum *F.culmorum*

.(Smiley , 2005 ; Smily and Patterson, 1996)

Bipolaris

Rhizctonia solani *Macrophominia phaseoliana* *C.globosum* *Chaetomium elatum* *sorokiniana*

(2005)

Sclerotium rolfsii

.(1978)

Fusarium culmorum

T. harzianum

(2011)

:

2012

:

2012/5/10 4/12

$$100 \times \frac{\text{---}}{\text{---}} = \text{---} \%$$

:

(NaOCl)

%1

(0,5)

/

39,5) Himedia

(PDA) Potato Dextrose Agar

/ 50

()

(

.....*Fusarium poae*

(°2±25) / (5)

(2006) Hunter Barnnet

.Leslie and Summerell, (2006) ; Kumar *et al.*, (2002) ; Chand *et al.*, (2002)

Carnation leaf Agar (CLA)

Fusarium

Fusarium culmorum *Fusarium graminearum* *Fusarium poae*

$$100 \times \frac{\quad}{\quad} = \quad \%$$

: DNA

/

PDA

F.poae *F.graminearum* *F.culmorum* *B.sorokiniana*

2±25

: DNA

B.sorokiniana

Fusarium spp.

PDA

BIO NEER

(Kit)

2±25

.DNA

: *Fusarium poae*

Fusarium poae

CinnaGen

:

Fusarium poae

:1

		5-3	(bp)
<i>F. poae</i>	Fp-82F	CAA GCA AAC AGG CTC TTC ACC	220
	Fp-82R	TGT TCC ACC TCA GTG ACA GGT	

BIO NEER

Master mix

PCR Buffer Mgcl2 Taq polymerase dNTP (0,2)

Master mix

24 18 / 100
 90 10 / 10
 (Epindorff tube)
 4 1,25
 (2) 41
 Denaturation 94 (Thermal cycle)
 30

PCR :2

Primer	Initial Denaturatio	Denaturation temperature	Annealing temperature	Extension temperature	Final Extension temperature	Hold temperature
Fp82F Fp82R	90 94 1	30 94 40.	30 62 40.	7240 40.	7 72 1	4

2012

Crown &

Damping off

foot root rot

%16.9

% 40

.0.25

0,4

0.35

%.21.5

% 25.8

(2011)

(3) 0.2

(2013)

% 34,32

(2013)

2012

:3

25.8	21.5	24.5	25.5	22.5	16.9	27.5	40	%
0.22	0.25	0.20	0.35	0.25	0.35	0.32	0.4	

:

()

38-18 X 7-3,5

8-5

10- 5 X

(Fp)

Leslie and Summerell, (2006)

Fusarium poae (Peck) Wollenweber

.Stenglein (2009) ; Nelson *et al.*, (1983)

B.

F.poae

(2011)

F.graminearum F.culmorum sorokiniana

(4)

.(2013) (2005)

%54.1

B.sorokiniana

%25.4- 20.2

F.culmorum

%37.1

F.poae

%10.4

% 20.7

F. graminearium

.% 19.1 -10.4

.poae F.graminearum F.culmorum

and Brennan (2009) ;Smiley and Patterson (1996))

.(2013

2013

2011

; Murray

:4

%								
2.2	3.0	4.5	6.0	5.0	7.2	6.5	4.3	<i>Alternaria sp</i>
40.0	38.5	37.1	44.1	39.5	47.1	39.1	54.1	<i>B. B.sorokinana</i>
22.2	25.4	20.2	21.1	24.4	22.2	21.2	21.1	<i>F. F.culmorum</i>
17.5	14.5	20.7	13.4	14	12.5	20.1	10.4	<i>F. F.graminearum</i>
17.2	19.1	17.5	15.4	17.1	11.13	13.1	10.4	<i>F. F.poae</i>

:

F.poae.

Polymerase Chain Reaction

FP82R FP82F

(PCR)

220

2

F.poae

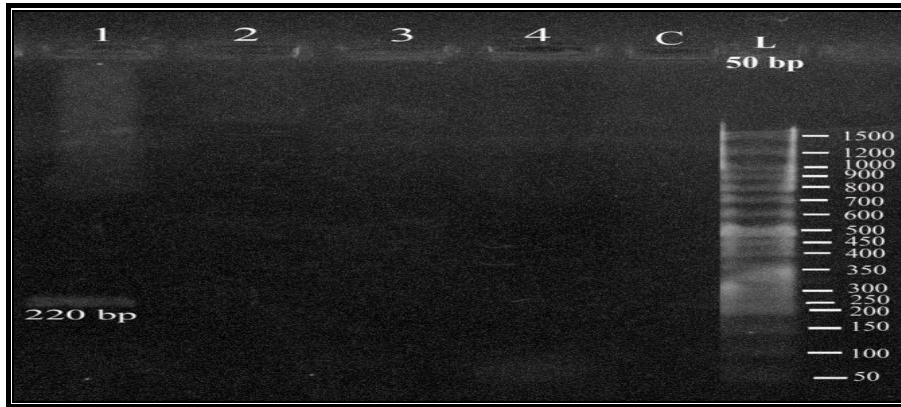
and Nicholson (1996) ;Matušinsky *et al.*, (2013)

(1)

4 3 2

F.poae

Pszczołkowska *et al.*, (2013); Parry



FP82F

:1

F.culmorum=3 *B.sorokiniana* = 2 *F.poae*=1 *F.poae* **FP82R**

= L = c *F.graminearum*=4

.(2013)

.(2006)

Fusarium spp.

.74-67 **24**

.(2011)

Trichoderma harzianum Rifai

.(2005)

.(2013)

.13 .

.(1978)

. 94 .

Barnett, H.L.; Hunter, B.B. (2006). "Illustrated Genera of Imperfect Fungi". APS Press, 218 pp.
 Chand, R.; Singh, H.V.; Joshi, A.K.; Duveiller, E. (2002). Physi-ological and morphological aspects of *Bipolaris sorokiniana* conidia surviving on wheat straw. *Plant Pathol. J.*, **18**, 328–332.

- Kumar, J.P.; Schafer, R.; Huckelhoven, G.; Langen; Baltruschat, H.; Stein, E.; Subramanian, N.; Kogel, K.H.; Kumar, J.; Nagarajan, S. (2002). *Bipolaris sorokiniana*, a cereal pathogen of global concern: cytological and molecular approaches towards better control. *Mol. Plant Pathol.*, **33**, 338 – 351.
- Leslie, J.F.; Summerell, B.A. (2006). *The Fusarium, Laboratory Manual*. Black Well Publishing. 288 p.
- Matušinsky, P.; Polišenská, I.; Kadlíková., M.; Tvarůžek., L.; Spitzerová, D.; Spitzer, T. (2013). Dynamics of T-2 toxin synthesis on barley ears. *J. Food, Agric. Environ* , **11**(3 and 4), 1114 - 1122.
- Murray, G.M.; Brennan, J.P. (2009). *The current and potential costs from diseases of wheat in Australia*. Grains Research and development corporation. 208p.
- Nelson, P.E.; Toussoun, T.A.; Marasas, W.F.O. (1983). *"Fusarium species: An Illustrated Manual for Identification"*. Pennsylvania State University Press, University Park. Pennsylvania, 122 p.
- Parry, D.W.; Nicholson, P. (1996). Development of a PCR assay to detect *Fusarium poae* in wheat. *Plant Pathology* **45**, 383- 391.
- Pszczółkowska, A.; Okorski, A.; Jarmońkiewicz, J. (2013). Fungal pathogens of the genus *Fusarium* in winter. **62**(2).
- Smiley, R.W. (2005). "Compendium of Wheat Diseases and Pests". 3rd ed. The Pennsylvania State University Press, University Park, MN, USA, 37-39 pp.
- Smiley, R.W.; Patterson, L.M. (1996). Winter wheat yield and profitability from Dividend and Vitavax seed treatments. *J. Prod. Agric.*, **8**, 350-354.
- Stenglein, S.A. (2009). Offered Review *Fusarium poae*: a Pathogen that needs more attention. *J. Plant Pathol.*, **91**, 25-36.