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First authentic report of fall armyworm presence in Faisalabad Pakistan

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Abstract

Fall armyworm is a sporadic pest and feed on almost 80 plant species. It is native to America but due to its strong flying abilities it has spread to Africa and now it has been reported in most of the Asian countries. In the present study presence of fall armyworm was observed in Faisalabad, Pakistan. At the end of Oct. and November larval collection from a maize field were examined in laboratory following dichotomous key of Passoa 1991. Larvae were also reared to adults. After examination it was identified that larvae and adults were *Spodoptera frugiperda*. And this is the first confirmed report that shows the presence of *Spodoptera frugiperda* in Faisalabad, Pakistan.

Keywords: *Spodoptera frugiperda*, invasive pest, maize pest

Introduction

Fall armyworm is a voracious feeder and sporadic pest of almost 80 plant species (Montezano *et al.* 2018) [7]. It is native to South and North America (Georgen *et al.*, 2016) [5]. From America it invaded Africa in 2016 and quickly spread all over Africa. Until December 2018 FAW was reported in 44 African countries causing lose almost \$US13 billion annually in maize, sugarcane, sorghum and rice (Abrahams *et al.*, 2018) [1]. After Africa now it has been reported in India, China, Iran and some other countries. And now the presence of fall armyworm has also been reported in Pakistan (Naeem-Ullah *et al.*, 2019) [9].

Although fall armyworm has a wide host range it does not feed on all crops equally (Barros *et al.*, 2010) [3]. The most preferred host of FAW is corn (Murua *et al.*, 2008) [8]. FAW feed and attack on almost all parts and stages of the corn. It is estimated that FAW can cause 15-73% lose in corn field (Hrsuka and Gould, 1997) [6]. FAW is spreading quickly due to its strong flight. It can fly to 100 Km in a night. Moreover fall armyworm remain active all the year and does not diapause in winter (Garcia *et al.*, 2017) [4]. FAW can complete the developmental process even below 18°C. These distinguishing characters has made fall armyworm more destructive (Barfield *et al.*, 1978) [2].

In the recent study the presence of fall armyworm was monitored in the areas of Faisalabad, Chiniot, Gojra and Ameen Pur Bangla between August to November 2019. At the end of October the presence of fall army worm detected and collected larvae were reared to adults. It is the first report that confirms the presence of fall armyworm in Faisalabad.

Materials and Method

Corteve Agrisciences started a project regarding monitoring of fall armyworm from 1st august 2019. Working as interne under Corteve Agrisciences we did pest scouting in 210 different Corn fields in Chiniot, Ameen Pur Bungla and Gojra territory from 1st August to 30th November. Both hybrid and desi varieties were clearly examined following zig zag method of pest scouting. From each field three patches were selected randomly and Z-scheme for pest scouting was followed for each patch. Collected samples were examined under microscope following dichotomous key of (Passoa, 1991) [10]. These specimens were reared to adult under laboratory conditions in glass boxes of 40 cm length and width and 60 cm height (Fig 5: H & I).

Results and Discussion

From a corn field in 295 JB Faisalabad (Lon.73.02732, Lat.31.37713, Alt.176m) [9] lapidopterous larvae were collected on 29th Oct 2019.

These larvae were examined following dichotomous key of Paoa (Paoa 1991) ^[10]. 7 out of 9 larvae were *Spodoptera frugiperda*. In another visit to the same field on 19 and 20th November 67 larvae were collected and examined in laboratory 58 larvae were *Spodoptera frugiperda*. These larvae include 2nd to 4th instar which reared on natural diet in laboratory condition.

Larvae have upward-down Y-shape marking of yellow colour on dark head, four black spots forming a trapezium on each segment and last body segment have four spots forming a square (Fig 1:A&B). Morphological characters of examined specimens were similar as reported by (Todd *et al.*, 1980) ^[14] (Pogue, 2002) ^[11].

Pupa reddish brown and have cremaster (Fig 3 (E)). Male adults are greyish brown have grey brown forewings which

have shaded oval or orbital spots. Female does not have distinguished markings on forewing (Fig 4: F & G)

On field the attack of fall armyworm can be simply distinguished from other lepidopterous insects. Characteristics shot holes appear on the leaves of infested plant. Larvae remain inside the whorl. A bulk of faecal matter of light brown colour appear inside the whorl (Fig 2: C & D) Larvae feed on growing cob and silk and also feed on tassel (Sisodiya *et al.*, 2018) ^[13]. *Spodoptera litura* and *Spodoptera exigua* were damaging pest of genus *Spodoptera* before the invasion of *Spodoptera frugiperda* (Naeem-Ullah *et al.*, 2019) ^[9]. Before invasion in Pakistan this pest invaded India in 2017 or early 2018 (Sidana *et al.*, 2018) ^[12].

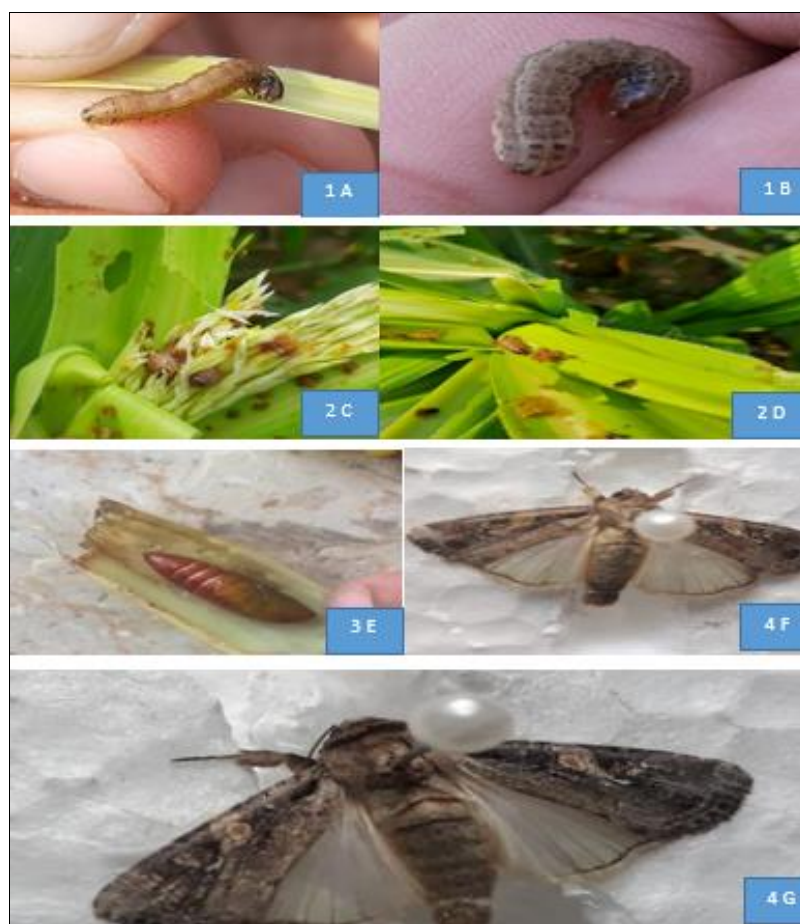


Fig: 1A & 1B (Larvae), 2C & 2D (Damage Caused by Larvae), 3E (Pupa), 4F & 4G (Adult).

Conclusion

Morphological findings of the collected samples it is concluded that specimens were *Spodoptera frugiperda*. This is the first authentic report that confirms the presence of *S. frugiperda* in Faisalabad. We have found *S. frugiperda* in Maize as it is the preferred host. Looking at wide range of host and moving capacity it can spread to other hosts soon.

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