Short Communication

A RARE ABNORMALITY IN FLOWER OF Orobanche aegyptiaca – A NEW REPORT

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ABSTRACT

A survey of agricultural fields of Banda district of Uttar Pradesh India was carried out in March 2016. During the survey, authors observed the floral morphology of Orobanche aegyptiaca and found abnormalities in the flowers such as double pistil and eight stamens instead of single pistil and four stamens. Moreover, the normal flowers showed 86.25% viable pollen grains, whereas, the abnormal flowers showed 33.34% pollen viability. To the best of our knowledge, no report so far of abnormalities is found in flowers of O. aegyptiaca. This study is the first report of abnormality in flower of O. aegyptiaca in Banda district of Uttar Pradesh India.

Keywords: Egyptian broomrape, floral characters, Orobanche aegyptiaca, Utter Pardesh

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Orobanche aegyptiaca, Egyptian broomrape is an angiospermic root holoparasite in the family Orobanchaceae. It causes severe damage to a wide array of dicotyledonous families such as Apiaceae, Asteraceae, Brassicaceae and Solanaceae. Orobanche aegyptiaca is naturally distributed across southern Europe, Northern Africa, the Middle East, South Asia and some parts of Africa (Parker, 2012). In India, Orobanche Spp. have been known as a problem mainly to brinjal, onion, tobacco and mustard (Akhter and Khan, 2018a; Akhter and Khan, 2018b; Akhter et al., 2018; Akhter and Khan, 2017). Devoid of any photosynthetic machinery, the modus operandi of these highly competitive plant parasites is to attach themselves with the crop roots and divert photosynthates such as carbohydrates and amino acids required for normal physiological functions along with water and minerals.

Agricultural fields of Banda district, Uttar Pradesh (India) were surveyed in March, 2016. Several fields growing vegetables mainly brinjal were found severely infested with Egyptian broomrape. For the identification of broomrape, morphological characters were evaluated and compared with the identification key for weedy broomrapes as suggested by Parker and Riches (1993) and Joel and Eizenberg (2002). While observing floral behavior in broomrape, we were impressed by the frequency of occurrence and variety of abnormalities in flower. Double pistil and eight stamens were present. Percentage pollen fertility (sterility) were also estimated in both the flower (normal and abnormal) by the following formulae:

$$\text{Pollen fertility}(\%) = \frac{\text{N o f p g}}{\text{T t m o p g a}} \text{ X } 100$$

The pollens from mature and undehisced anthers were dusted on slide containing a drop of 1% acetocarmine. We were flabbergasted and therefore, a study of approximately 100 flowers was conducted.

Before describing an abnormal flower, a brief description of normal flower is necessary. As described in figure (1. A). The normal flower has a single pistil and four equal sized epipetalous stamens present around 4-5 mm above the base of the corolla. Stigma is whitish and bilobed. Anther lobes are hairy. Abnormal flowers such as those found in this study have certain primary deviations from the normal flower. In this study, two pistils were present in single corolla. Both the pistils were separated from each other. The ovary was bicarpellary with single style and stigma. Eight stamens were inserted 4-5 mm above the base of corolla (figure 1 B). Fertile pollen diameter ranged between 7.81-10.93µm with a mean of 9.06 µm, whereas the sterile pollen diameter ranged between 6.81-8.93µm with a mean of 8.64 µm. The Pollen grains which took stain and had a regular outline were considered as fertile (Figure 2 A), while those without or less stain, irregular shape and size were considered as sterile (figure 2 B). Moreover, the normal flower showed the 87 % viable pollen grains whereas the pollen fertility in abnormal flower was 33.34%.

From the aforementioned observations, it is concluded that the O. aegyptiaca showed irregularity in number of pistil and stamens. A more intensive investigation is to be conducted for the assessment of causal factors, leading to such abnormalities. To the best of our knowledge, no report so far of the such abnormalities has been found in flowers of O. aegyptiaca. This study is the first report of abnormality in the flower of O. aegyptiaca in Banda district of Uttar Pradesh, India.

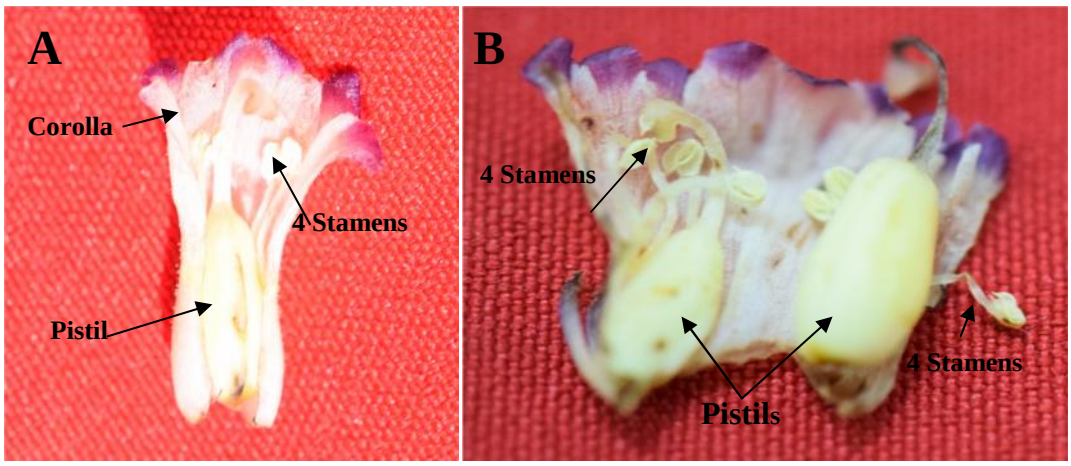

Figure 1 A Showing normal flower with single pistil and 4 stamens; B showing abnormalities double pistil and 8 stamens.

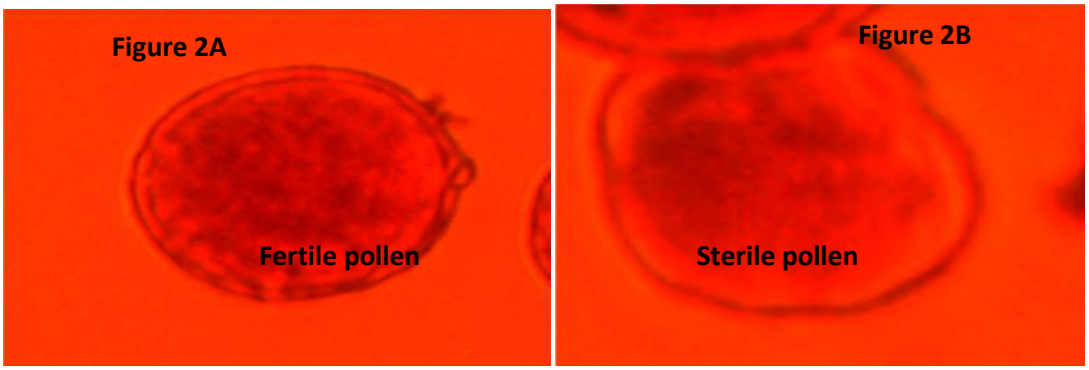

Figure 2 A Showing fertile pollen and Figure 2 B showing sterile pollen.

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