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Graduate school
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The Thesis Submitted for the Degree of PhD (in the field of Plant Pathology)

**Identification and classification of some causal agents of
plant white blister rust in North and East of Iran using
morphological and molecular techniques**

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Abstract

The pathogens causing white blister rusts on members of Brassicaceae, Asteridae and Caryophyllales are classified in three genera including *Albugo*, *Pustula* and *Wilsoniana* (Albuginales, Oomycota), respectively. The current study contributes to our knowledge on Albuginales in Iran. An extensive survey for sampling white blister rust specimens was performed during the 2018-2020 growing season in some regions in Eastern and Northern Iran. Based on morphological and molecular (cox2 and ITS) data. As the result *Albugo lepidii* on *Lepidium sativum*, *Albugo koreana* on *Camelina transcaspica*, *Pustula junggarensis* on *Takhtajianantha pusilla*, *Albugo arenosa* on *Strigosella africana*, *A. candida* on various hosts, *Albugo occidentalis* on spinach and *Wilsoniana portulacae* on *Portulaca* sp. were identified. This is the first report that morphologically and molecularly verify *A. candida* on *Goldbachia laevigata*, *Raphanus sativus*, *Eruca sativa* from Iran and on *Sinapis arvensis*, *Savignya parviflora*, *Isatis leuconeura* and *Sisymbrium altissimum* worldwide. *Sisymbrium septulatum* and *Strigosella grandiflora* are reported as *Matrix nova* for *A. candida* and *A. arenosa*, respectively. White blister rust caused by *A. candida* is reported for the first time on a member of the genus *Savignya* in Iran. *Albugo lepidii*, *A. koreana* and *Pustula junggarensis* are new records for Iranian mycobiota. Detailed descriptions and illustrations along with phylogenetic placement here are provided for *Wilsoniana amaranthi*, *Wilsoniana portulacae* and *Albugo occidentalis*. Based on morphological and molecular data, two new lineages of *Albugo* on *Lepidium sativum* and *S. africana* are reported and several undescribed species belonging to the genus *Pustula* on *Lactuca undulata*, *Senecio* spp., *Xeranthemum inapertum*, *Steptorhamphus* sp. and *Steptorhamphus persicus* and from the genus *Albugo* on *Chorispora tenella* were identified.

Keywords: Albuginales, morphology, phylogeny