



First report of *Puccinia dracunculina* on *Artemisia dracunculus* in Turkey

H. Kavak^{1*} and A. Bilgili²

¹ Dicle University, Agricultural Faculty, Plant Protection Department, 21280 Diyarbakir, Turkey; ² GAPTAEM, Plant Health Department, Şanlıurfa, Turkey

*E-mail: hamit.kavak@dicle.edu.tr

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Artemisia dracunculus var. *sativa* (tarragon) is a medicinal and spice plant, grown commonly in home gardens, in southern and southeastern districts of Turkey. It has also been cultivated organically in fields of the Şanlıurfa region in southeastern Anatolia for over a decade. During surveys performed in early summer 2014, a severe rust disease was observed on organically cultivated tarragon plants in this location. The severity of the disease attack appeared to increase during the summer season. Many leaves, covered with dense uredinial pustules (Fig. 1), had died before flowering.

Uredinia were light brown, globose to irregular, 70-250 µm across, mostly colonising the lower surfaces of leaves with some on the upper surfaces and on the stems. The urediniospores were nearly colourless, had a wall of even thickness and varied in shape to include spherical, ellipsoidal, and pyriform and other irregular forms, 13-22 x 26-38 µm (Fig. 2). Some telia, dark brown and 100-300 µm across, occurred on the lower surface of leaves, starting to appear at the end of summer, increasing in autumn (Fig. 3). The teliospores were brown, typically two celled, 21-25 x 40-55 µm, with a wall of uneven thickness. Many of the teliospores had characteristic, colourless pedicels that varied in length from 42 to 78 µm (Fig. 4). Based on these properties, the rust pathogen was identified as *Puccinia dracunculina* Fahrend. (Fahrendorff, 1941). The uredinial stage of this rust pathogen was the dominant and active form during the summer season while the telial stage was active in autumn or mid-autumn, similar to the results of Cohen *et al.* (2013). Although this species is autoecious, basidiospores were not observed.

Pathogenicity tests were performed on one-month-old healthy *A. dracunculus* var. *sativa* plants grown from rooted cuttings in pots. Using a fine brush, urediniospores were brushed from pustules onto fresh, naturally infected leaves of field tarragon plants held in a petri dish. A suspension of urediniospores was prepared in sterile, distilled water containing one small

drop of Tween 20 per 100 ml (Kavak, 2003) and adjusted to 1×10^4 spores per ml. Nine plants were sprayed with the urediniospore suspension and three plants were sprayed with sterilised distilled water as controls. All plants were enclosed in a plastic bag for 48 h after spraying and kept at 20°C in a greenhouse. First symptoms, similar to those on naturally infected plants, occurred two weeks after inoculation on the plants inoculated with the spores but the controls remained symptomless. Urediniospores were later re-isolated from inoculated plants, but not in controls. This rust disease appears to be a major problem on tarragon in Turkey, particularly under organic cultivation in the Şanlıurfa district. According to research, this rust species infects only tarragon and is known throughout the world where this plant is cultivated (Gamliel & Yarden, 1998). However, to our knowledge this is the first report of *P. dracunculina* on *A. dracunculus* in Turkey.

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Figure 1



Figure 2



Figure 3

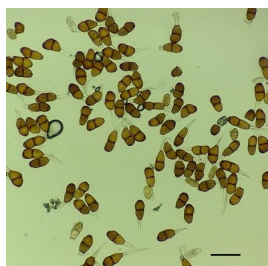


Figure 4

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