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ADDITIONS TO UREDINALES OF NORTHERN AREAS OF PAKISTAN

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Abstract

During the uredonological survey of Northern areas of Pakistan, *Cronartium ribicola*, *Puccinia coronata*, *Puccinia taraxaci* and *Aecidium clematidis* have been found infecting different plant species. These rust taxa are being reported for the first time from northern areas of Pakistan. With these four rust taxa, the rust flora of Northern areas of Pakistan now consists of 80 taxa.

Introduction

This is the second report in series of paper on Uredinales of Northern areas of Pakistan. The rust fungi were collected from Tatu-Fairy Meadow Track, Nalter and Danyor (Gilgit) of northern areas of Pakistan during August-September, 2003. The host plants are common in Hazara, Gilgit, Murree, Dir, Chitral and Kashmir and have been found growing from an altitude of 2000-8000/ (Stewart, 1972). For the detail of sampling site, climate of the area and methodology see Sultan *et al.,* (2006).

Description of taxa

1. *Cronartium ribicola*

Fischer in Rabb. Fungi EUR. NO. 1595 & *Hedwigia* 11:182, 1872; *Syd. Monogr. Ured*. 3: 567; *Sacc. Syll. Fung.* VII: 598; *Malik & Khan*, p. 523.

Fig. 1. A-B

Spermagonia, aecia and telia not found. Uredinia hypophyllous, scattered, brown, showing blister like outgrowths, 130-133µm high, 210-380µm wide (Fig. 1 B); urediniospores 18-24 × 20-22µm, obovoid, ellipsoid, echinulate and light yellow.

On *Ribese orientale* Desf. (Fig. 1A) from Tatu-Fairy Meadow Track, August 23, 2003, I, Holotype # AS 42.

This fungus has already been reported from Pakistan on *Ribese rubrum* Linn., from Shogran, Kaghan Valley by Ahmed (1956). This is for the first time reported on *Ribese orientale* from Tatu-Fairy Meadow Track, Northern areas of Pakistan.

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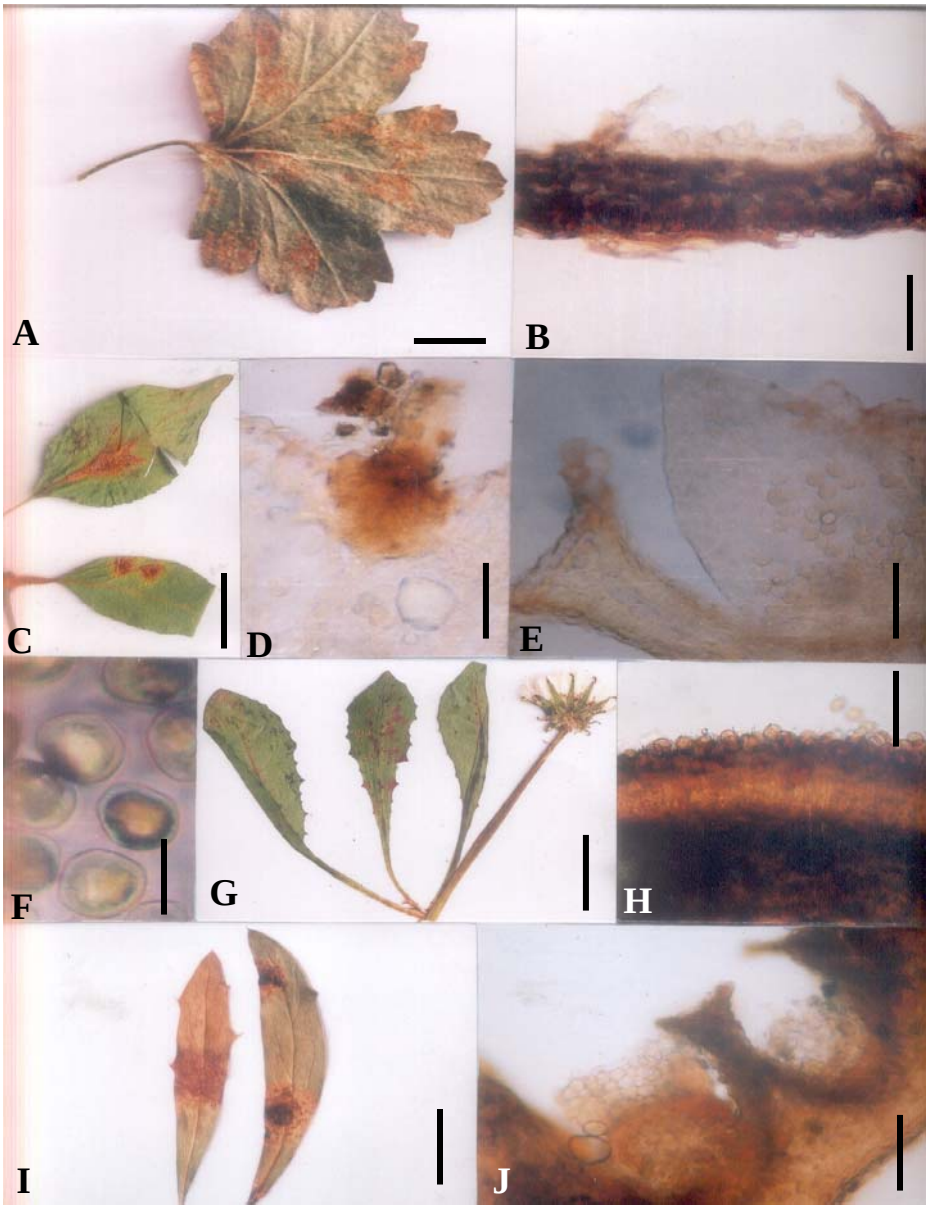

Fig. 1, (A) Infected host (*Ribese orientale*). Scale bar = 0.5cm, (**B)** Cross section of uredium showing hyaline urediniospores. Scale bar = 50 µm, **(C)** Infected host (*Rhamnus virgata*). Scale bar = 1 cm, **(D)** Cross section of infected leaf showing spermogonium. Scale bar = 55 µm, **(E)** Cross section of infected leaf showing aecidium containing aeciospores. Scale bar = 21 µm, **(F)** Aeciospores. Scale bar = 15 µm, **(G)** Infected host (*Taraxacum officinale*). Scale bar = 1.0 cm, **(H)** Cross section of infected leaf showing uredinium containing urediniospores. Scale bar = 62 µm, **(I)** Infected host (*Berberis lycieum*). Scale bar = 1.0 cm, **(J)** Cross section of infected leaf showing aecidium containing aeciospores. Scale bar = 81 µm.

2. *Puccinia coronata* Corda, Icon. Fung. I: 6, 1837.
Fig. 1, C-F

Spermogonia scattered among the aecia, light to dark brown, 104-106μm high and 106-112μm wide (Fig. 1, D). Aecia hypophyllous, in smaller or larger groups, on stem, petiole and along the veins of the leaf, causing hypertrophy, cup shaped or postulate, yellowish, peridial cells unequal and irregularly arranged, outer wall thicker than inner wall, 121-134μm wide and 132-168μm high, aecia cup shaped (Fig. 1, E); aeciospores globose, subglobose, ellipsoid, ovoid, hyaline, aciculate**,** 22-26×15-24 μm (Fig. 1, F), germ pore obscure. Uredia and telia not found.

On *Rhamnus virgata* Roxb. (Fig. 1, C) from Nalter- Lake 1 Track , August 31, 2003, O and I, # AS 16.

According to Wilson & Henderson (1966) spermogonia and aecia of *Puccinia coronata* are produced on *Frangula* spp., and *Rhamnus* spp., while uredia and telia are produced on *Agropyron* sp., *Agrostis* spp., *Alopecurus* sp., *Avena* spp., and *Fastuca* spp.

This fungus has already been reported from Pakistan on *Agrostis* sp., *Rhamnus virgatus* and *Festuca* sp., by Ahmed *et al*., (1997). This fungus is for the first time reported from Northern areas of Pakistan.

3. *Puccinia taraxaci* (Rebent.) Plowr. Monogr. Ured.p: 186, 1889.
Fig. 1, G-H

Spermogonia and aecia not found. Uredia amphigenous, scattered, minute, pulverulent, brown and irregular in shape. Uredospores globose, subglobose, ovate, ellipsoid, echinulate, 23-27 × 20-23μm (Fig. 1, H), germ pore 1. Telia not found.

On *Taraxacum officinale* Linn. (Fig. 1, G) from Danyor (Giligit), September 4, 2003, II, # AS 29.

The uredial and telial stages of this fungus has already been reported from Kaghan, Pakistan by Ahmed (1956) on same host. The spermogonial and aecial stages have not so far been collected from Pakistan.

This fungus is for the first time reported from Northern areas of Pakistan.

4. *Aecidium montanum* Butl. in India Forester 1905.
Figs. I-J

Spermogonia, uredia and telia unknown. Aecia hypophyllous, cup shaped, yellowish spots with brown margins, grouped or scattered, 190-410μm high and 100-390μm wide; aeciospores globose, subglobose, catenulate (Fig. 1, J), hyaline, aciculate, 22-30 × 21-22 μm, germ pore obscure.

On *Berberis lycium* Royle (Fig. 1, I) from Danyor, September 2, 2003, I, # AS 40.

This fungus has already been reported from Pakistan on *Berberis pachyacantha* Koehne, *B. zabeliana* C. k. Schn. and *B. lycium* from Barum valley, Nathia Gali, Changla Gali and Shogran, Pakistan (Ahmed, 1956; Malik *et al.*, 1968).

Aecidium montanum is for the first time reported from Northern areas of Pakistan.

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