

ADDITIONS TO THE RUST FLORA OF PAKISTAN

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More than 300 taxa of the rust fungi (Uredinales) have been reported from Pakistan. (Ahmad, 1956 a,b, 1969, 1976; Jorstad & Iqbal, 1967; Gjaerum & Iqbal, 1969; Mirza & Qureshi, 1978; Khalid *et al.*, 1993, 1995; Masood *et al.*, 1995; Khalid & Iqbal, 1996; Okane *et al.*, 1992; Ono, 1992; Ono & Kakishima, 1992; Kakishima, 1992; Kakishima *et al.*, 1993a, b; Kaneko 1993). Four taxa of the rust fungi viz., *Puccinia caricis-filicinae* Barclay, *P. crepidicola* Syd., *P. sessilis* W.G. Schneider var. *sessilis* and *Uromyces fragilipes* Tranz., are reported as new records for Pakistan.

1. *Puccinia caricis-filicinae* Barclay Fl.Fr., 6:60: 1889. (Fig.1B).

Spermogonia and aecia unknown. Uredinia not found. Telia amphigenous, scattered, ca 0.3 mm in diam., orbiculate, dark brown, pulvinate; teliospores oblong or oblong-clavate, rounded or rarely conical attenuate at apex, strongly thickened, constricted at the septum, rounded or often attenuate at the base, smooth, brown, 30-49x15-24 μm ; pedicels subhyaline, often mildly brownish apically, persistent, upto 50 μm long.

On *Carex filicina* Nees with III stage. Murree, SHI Mycological Herbarium # 1530.

2. *P. crepidicola* Syd. *Oest. Bot. Zeit.*, 51: 17. 1901. (Fig.1A).

Spermogonia and aecia unknown. Uredinia amphigenous or caulicolous, scattered, pulverulent, pale brown; urediniospores globose or subglobose, pale brown, 21-25x8-21 μm , wall echinulate, 1.5-2.5 μm thick, with 2 equatorial pores. Teliosori amphigenous or caulicolous, minute and sometimes jointed, blackish brown; teliospores ellipsoid to ovoid, rounded at both ends, not thickened above, scarcely or not all constricted, dark brown, 30-36x18-24 μm , wall 3-4 μm thick, finally verrucose, pore of upper cell subapical, of lower equatorial, pedicel very short, hyaline.

On *Crepis* sp., with II, III stages. Astore Valley, near Chillum, SHI Mycological Herbarium # 91-32, Sept. 12, 1991.

3. *Puccinia sessilis* W.G. Schneider in Schroeter *Abh. Scles. Nat. Abth.*, 1869-72: 19.1870 var. *sessilis*. (Fig.1C).

Aecia and telia not recorded. Uredinia amphigenous, about cinnamon-brown; urediniospores broadly ellipsoid or obovoid, 27-32x22-26 μm , wall 1.5 μm thick, golden or cinnamon-brown, echinulate, germ pores 5-6, scattered.

On *Phalaris minor* Retz., with II stage, on way to Deosai Plains, near Pakora Lake, SHI Mycological Herbarium # 91-40, Sept. 8, 1991.

4. *Uromyces fragilipes* Tranz. *Ann. Mycol.*, 5: 549. 1907. (Fig.1D).

Aecia and telia not found. Uredinia on adaxial leaf surface, pale yellowish; uredospores broadly ellipsoid to obovoid, 24-32 x 22-28 μm ; wall 2-2.5 μm thick, echinulate, germ pores 8-10, scattered.

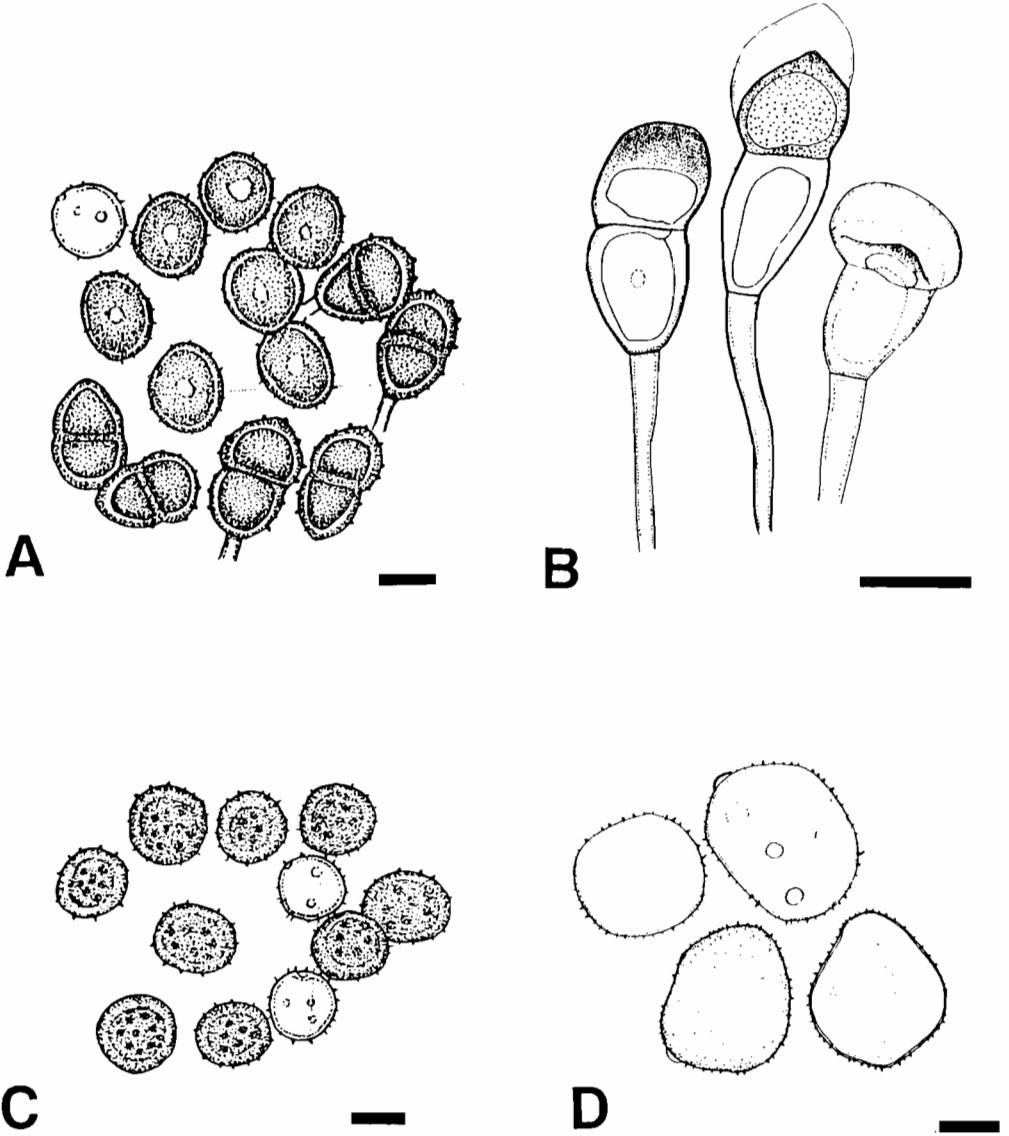


Fig.1. A-D; Lucida drawings of Uredo and Teliospore of new records of rust fungi from Pakistan.
A: Telio and uredospores of *Puccinia crepidicola*;
B: Teliospores of *P. caricis-filicina*;
C: Uredospores of *P. sessilis* var. *sessilis*;
D: Uredospores of *Uromyces fragilipes*. Scale Bar = 10 μ m for A,C, 20 μ m for B and 12 μ m for D.

On *Eremopyrum buonaparte* (Spreng.) Nevski, with stage II. SHI Mycological Herbarium # AM 1366.

E. buonaparte has been reported as a host for *Uromyces fragillipes* from Turkmenia and another host for this rust is *E. orientale* (Gjaerum per. comm.).

Acknowledgement

We sincerely thank Dr. Halvor B. Gjaerum, NPP Herbarium, for help in the identification of rust fungi.

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