

RESEARCH NOTE**Occurrence of Garlic Rust in Mid Hill of Nepal**

Ram D Timila, Sharada Joshi, Gyanu Manandhar and Sarala Sharma

Plant Pathology Division-NARC, Khumaltar-Lalitpur

Garlic (*Allium sativum* L.) is one of the common spice crops of Nepal. It is cultivated throughout the country, basically for bulbs as spice and young plants for vegetable. It is also used in traditional medicine. Its antimicrobial characteristics are likely due to sulphur compounds. It may also help to prevent cardiovascular diseases (Schwartz et al 1996).

Recently, a new rust disease in garlic was observed for the first time at Regional Agricultural Research Station, Lumle (ca. 1450 masl) during April 2005. The variety of garlic was Chinese lasun, which is grown as a local variety in the areas. Rust, caused by *Puccinia porri* G. Wint, in *Allium* species occurs in most of the North Temperate Zone and its severity varies among crops and localities (Hill 1996). The disease occurs most frequently under conditions of high humidity and low rainfall. Serious outbreak could reduce bulb weight from 25-60% with deterioration in quality. The disease was noticed at bulb formation stage of the crop. The leaves were severely infected that were almost entirely covered with pustules resulting yellowing and premature drying. Koike et al (2001) reported a yield loss up to 51% due to rust infection.

Early symptom consists of small circular to elongated, white flecks on leaves. As the disease progresses, those specks expand into oblong lesions. The tissue covered with the lesion ruptures and the masses of the uredospores with characteristic orange colour are released. Those uredospores are responsible for secondary disease spread. By this time, orange uredospores become visible as pustule. Teliospores develop later in the same leaf showing black pustule. The fungus overwinters as uredospores or teliospores (Hill 1996). Severely infected leaves are entirely covered with pustules, resulting in extensive yellowing, wilting and premature drying of leaves.

Infected plants were collected and examined in the laboratory of Plant Pathology Division-Nepal Agricultural Research Council, Khumaltar-Nepal. The symptoms and signs (Figure 1a and 1b) were verified and studied with the help of cited literatures (Hill 1996, Koike et al 2001) and under stereomicroscope. Characteristic single celled yellowish orange uredospores (Figure 2a and 2b) and bicelled gray teliospores with short pedicel were identified under compound microscope. According to the symptoms and laboratory examination, the causal pathogen was found to be *Puccinia porri* G.Wint (syn. *P. allii* F. Ruldophi). This is the first report of garlic rust occurrence in Nepal. However, it may spread and under congenial conditions, the outbreak may cause significant loss in garlic production in future.



Figure 1. Garlic leaf rust caused by *Puccinia porri*, a. leaf segments showing rust pustules, b. Teleutosori and uredosori.

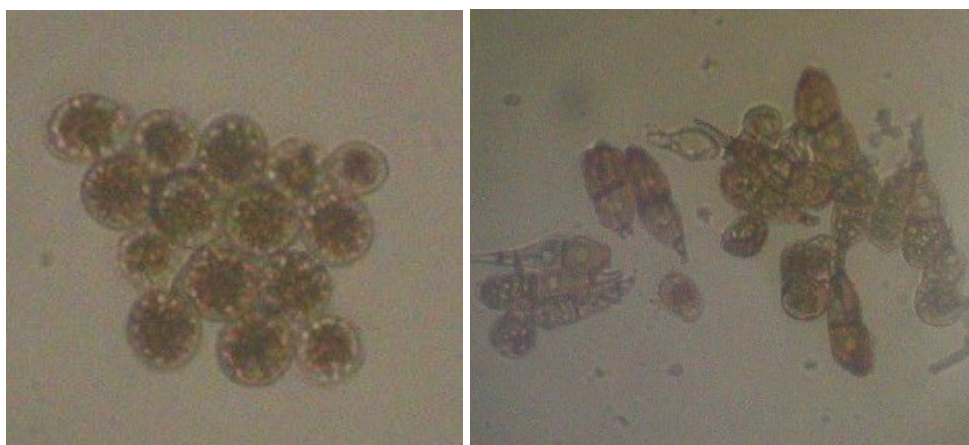


Figure 2. *Puccinia porri*, a. Uredospores, b. Teleutospores.

REFERENCES

- Hill JP. 1996. Rust. **In:** *Compendium of onion and garlic diseases* (HF Schwartz and SK Mohan, eds). American Phytopathological Society (APS). St. Paul, Minnesota 55121, USA. Pp. 24-25.
- Koike ST, RF Smith, RM Davis, JJ Nunez and RE Voss. 2001. Characterization and control of garlic rust in California. *Plant Dis.* 85:585-591.
- Schwartz HF, K Mohan, MJ Havey and F Crowe. 1996. The Genus *Allium*. **In:** *Compendium of onion and garlic diseases* (HF Schwartz and SK Mohan, eds). American Phytopathological Society (APS). St. Paul, Minnesota 55121, USA. Pp. 1-6.