

## First record of *Neoverysiphe cumminsiana* on horseweed in India

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**Abstract.** In March 2008, a severe outbreak of powdery mildew disease was observed on horseweed (*Conyza canadensis*=*Erigeron canadensis*). Based on the morphological characters, the pathogen was identified as the anamorph of *Neoverysiphe cumminsiana*. This is the first report of this organism causing powdery mildew on *C. canadensis* in Meghalaya, India.

Horseweed (*Conyza canadensis*) belongs to the family Asteraceae. It is native to North America (USA and Canada) but spread to Europe and later to Asia and Australia (Michael 1977). In India it is known as *Jarayupriya*. *Conyza canadensis* occurs as a weed in a wide range of crops, annual and perennial, especially where tillage is less intensive. It has been introduced internationally as a contaminant of cereals, forage seeds and cotton, and there is a risk of further similar introduction. It has been recorded as an alternate host of *Tomato bushy stunt virus* (Grbelja *et al.* 1988), fungal pathogens such as *Sclerotinia minor*, also aster yellows phytoplasma, and a range of insect pests (Weaver 2001). There are few estimates of its competitive effect, but in Romania yield reductions of 64% have been recorded in sugar beet (Sarpe and Torge 1980).

During March 2008, a severe outbreak of powdery mildew on *Conyza canadensis* was observed in Barapani, Meghalaya, India. Disease symptoms included grayish white irregular patches consisting of epiphytic mycelia and conidia on both surfaces of the leaves. Symptoms were more severe on lower surface of the leaves (Fig. 1). Both older and younger leaves were equally

susceptible. Symptoms were also present on stems. Infected leaves later turned necrotic. Voucher specimen has been deposited in Martin-Luther-Universität, Institut für Biologie, Bereich Geobotanik, Herbarium, Germany (HAL 2240 F.).

Conidia were harvested by dislodging them from infected tissue onto a strip of clear tape, using a camelhair brush. The tapes were mounted on microscope slides (Correll *et al.* 1987). Hyphae were up to 5–6 µm wide with multilobed appressoria (Fig. 2). Conidiophores were mostly erect with foot cells 22–34 × 8–17 µm, followed by 2–3 short cells. Conidia were cylindrical 32–37 × 17–22 µm and produced in chains (Figs 3 and 4). Fibrosin bodies were absent. Shoulder germination of conidia was also observed. Appressoria on germination tubes were lobed (Fig. 5). Based on these morphological characters the pathogen was identified as the anamorph of *Neoverysiphe cumminsiana* (Braun *et al.* 2002). No perfect stage (chasmothecium) was found to be associated with this fungus. Pathogenicity was confirmed by dusting conidia on healthy plants of *C. canadensis*, non-inoculated plants served as control. Inoculated plants developed symptoms after 8 days whereas control plants remained healthy.



Fig. 1. Powdery mildew symptoms on *Conyza canadensis* (HAL 2240 F.).

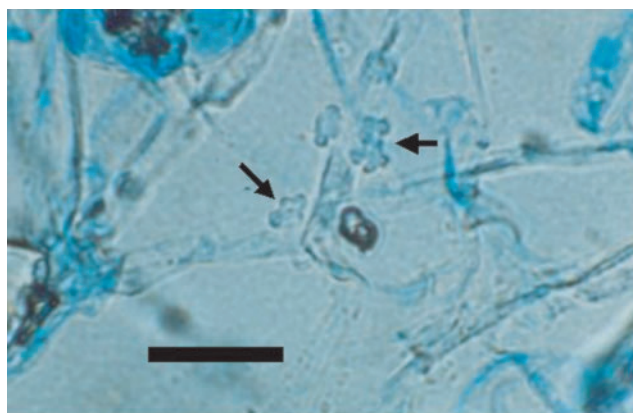
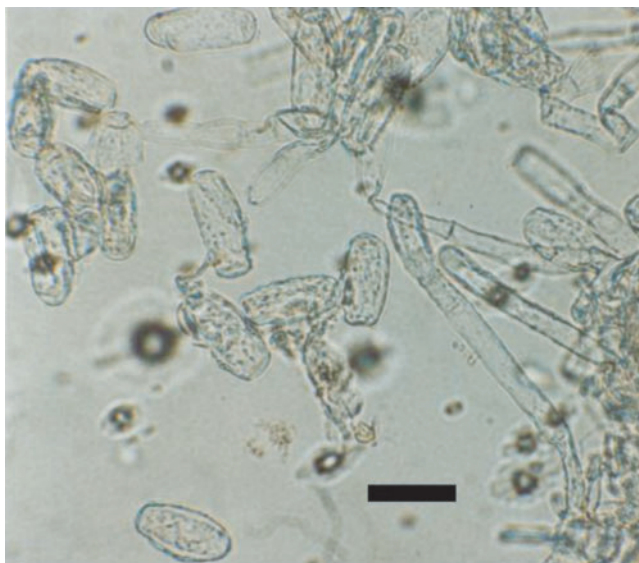


Fig. 2. Appressoria of anamorphic *Neoverysiphe cumminsiana* (HAL 2240 F.).

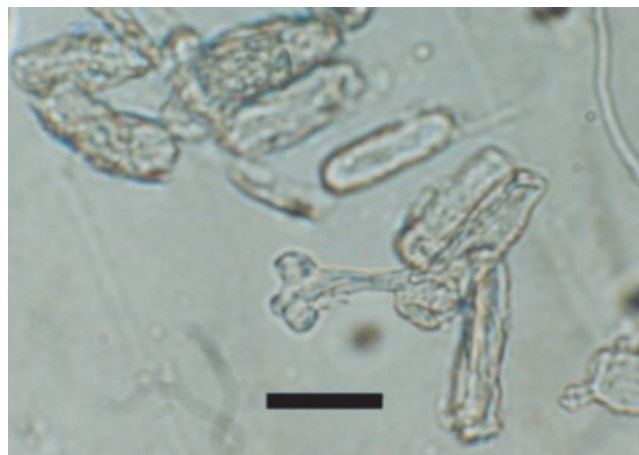


**Fig. 3.** Conidiophore and conidia of anamorphic *Neoverysiphe cumminsiana* (HAL 2240 F.). Bar = 20 µm.



**Fig. 4.** Conidia of anamorphic *Neoverysiphe cumminsiana* (HAL 2240 F.). Bar = 20 µm.

Earlier *Podosphaera fusca* has been reported on *Conyza* sp. from India (Ahmed *et al.* 2007). To our knowledge, this is the first record of powdery mildew of *C. canadensis* caused by anamorph of *N. cumminsiana* in India. An anamorph of *N. cumminsiana* has not been reported on any species of the genus *Conyza* from India. There is a possibility of involvement of this weed species as alternate host of powdery mildew pathogen infecting other plants.



**Fig. 5.** Shoulder germination of conidia of anamorphic *Neoverysiphe cumminsiana* (HAL 2240 F.). Bar = 20 µm.

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