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## SHORT COMMUNICATION

# A new report of downy mildew on buckwheat (*Fagopyrum esculentum*) caused by *Perenospora* sp. in Sikkim

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Buckwheat (*Fagopyrum esculentum*) is a fast growing annual herb belongs to the family Polygonaceae. During recent survey in December, 2012 to February 2013, buckwheat plants grown at ICAR farm in Sikkim, India was found severely infected with a unknown disease showing the symptoms like stunting, rolling of leaves and chlorotic spots on the upper side of the leaves. Microscopic observations of the diseased samples revealed the presence of conidiophores and conidia of downy mildew fungi *Perenospora* sp. This is the first report of downy mildew fungi *Perenospora* sp. This is the first report of downy mildew caused by *Perenospora* sp in buckwheat in Sikkim.

**Key words:** *Fagopyrum esculentum*, downy mildew, *Perenospora* sp. Sikkim

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Buckwheat (*Fagopyrum esculentum*) is a fast growing annual herb belongs to the family Polygonaceae. It thrives in cold climatic conditions and well drained sandy soil. Buckwheat grain is cultivated mainly for human consumption and as animal feed, commonly used as a flour to make haluwa, bread and porridge. It is also used as a vegetable, a green manure crop, as a smother crop to suppress weeds and as a source of buckwheat honey. Young shoots and leaves are eaten as vegetable in Sikkim and other parts of North East India. Buckwheat is grown through out a large area of Asia and Southeast Asia in marginal and fairly unproductive land. In Sikkim, buckwheat is cultivated for both grain and vegetable purposes and

is covering an area of 5540 ha with production of 5070 t (Anonymous. 2010-11).

During recent survey in December, 2012 to February 2013 it was found that the buckwheat plants growing in ICAR farm at Sikkim centre, Tadong, Gangtok, India was showing the symptoms like stunting, rolling of leaves and chlorotic spots on the upper side of the leaves (Fig.1). The leaves showing the symptoms were brought to the laboratory for further investigation and the infected portion was scrapped and observed under the microscope. Dichotomously branched conidiophores and conidia of *Perenospora* sp. were observed (Fig. 2). The identity of the fungus was confirmed from IARI at New Delhi. A reference sample has also been deposited in the herbarium of the Indian Ag-

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gricultural Research Institute, New Delhi (HCIO No. 51486). This is the first record of *Perenospora* sp infecting Buckwheat in Sikkim. The symptoms were first observed mostly on the lower leaves, later it spread upwards to other leaves, later it spread upwards to other leaves. In advance stage of infection the leaves died and dropped off from the plant. Conidiophores are dichotomously branched

at the apex and having the dimension of  $324\text{-}410 \times 10.5\text{-}12 \mu\text{m}$  and produced ellipsoid conidia of  $24 - 41 \times 10\text{-}14 \mu\text{m}$  in size (Fig. 3). Zimmer (1978) reported that the downy mildew infected buckwheat plants in Manitoba, Canada, showed stunting, leaf mottling and rugosity of some leaves. Tanaka (1934) described the pathogen as an agent of destructive leaf blight in buckwheat in Japan.



Fig. 1 and 2 :Symptom of downy mildew on leaves of buckwheat



Fig. 3: Conidiophore of *Perenospora* sp of buckwheat in 40X magnification

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### REFERENCES

- Anonymous. 2010-11. *Annual Report* FSA & DD, Govt. of Sikkim pp. 114
- Tanaka, I. 1934. New species of the downy mildew fungus on Buckwheat. *Trans. Sapporo. Nat Hist. Soc.* **13**: 203-206.
- Zimmer, R.C. 1978. Downy mildew a new disease of buckwheat (*Fagopyrum esculentum*) in Manitoba, Canada. *Plant Dis. Rep.* **62**: 471- 473