

Spore Release in *Uncinula necator*

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ABSTRACT

Conidia release in *Uncinula necator* on grape was studied with a Kramer-Collins spore sampler during October and November 1969 in Australia, and

in India in January and February 1970. Diurnal periodicity occurred on all days with midday peaks. *Phytopathology* 60:1702-1703.

Additional key words: powdery mildew of grape.

Although most species of powdery mildews release their spores during the day (1, 4, 7), very little is known of the periodicity of spore release in *Uncinula necator* (Schw.) Burr. Yarwood (7, unpublished data) reported that maturation of the conidia was diurnal. This report deals with studies of spore release of powdery mildew of grape in Australia in October and November 1969 and in India during January and February 1970.

Powdery mildew was observed on leaves of grapes grown from cuttings in the University of Adelaide greenhouses in October. The plants were in 6-inch pots, and each plant had three or four leaves. One of the plants was transferred to the Plant Pathology Department greenhouses, and daily, beginning 30 October, samples were collected using a Kramer-Collins spore sampler and techniques previously described (4). The leaf was rolled and fitted into a glass collecting tube (1.5 cm diam), where it remained during 19 days of continuous sampling. A single pustule (approx 15 mm diam) was present on the leaf. Spore production, good

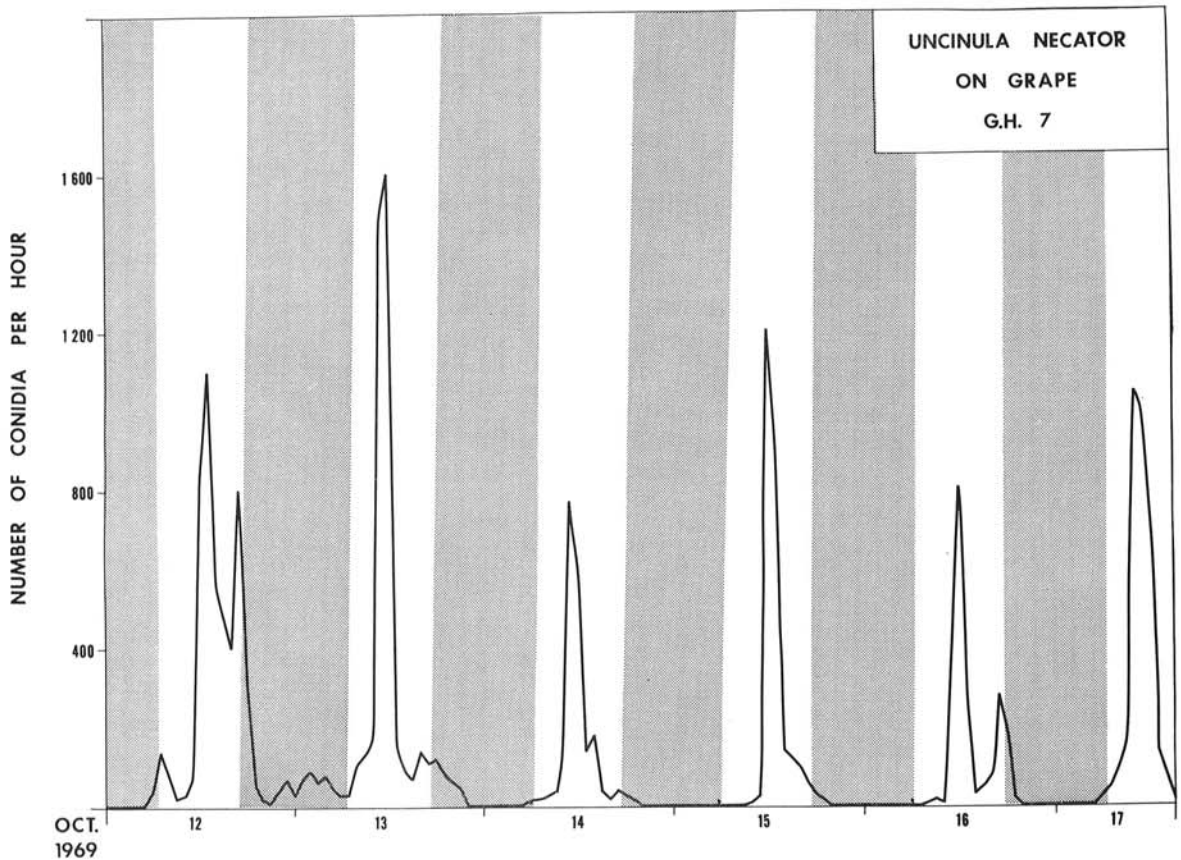


Fig. 1. Numbers of conidia of *Uncinula necator* under continuous sampling of a single grape leaf of a plant in a greenhouse. Stippled areas represent darkness.

throughout the 19-day period, was greatest on the 4th day and then leveled off. Temperatures fluctuated between 20 and 30 C; bench heat was used on cool nights, and evaporative cooling on warm afternoons. Humidity was high at all times.

A characteristic pattern of high daytime and low night-time numbers was evident on all days. Spore release on 6 consecutive days is shown graphically in Fig. 1. Spores began to appear on the slides during the 2nd hr after sunrise, increased rapidly to a peak at midday, then declined sharply. Peaks on 12-17 October (Fig. 1) were at 1 PM, noon, 11 AM, noon, noon, and 10 AM. Spores sometimes were present at night, as on 12 October (Fig. 1), but always in low numbers and without any pattern. On 12 and 16 October a second minor peak appeared in late afternoon.

From 20-28 Feb., *Uncinula* was sampled in a similar fashion in the Plant Pathology laboratories at Tirupati, India. Plants studied there were large, and were maintained near windows which faced south. Powdery mildew developed naturally on the leaves. Conditions in India were quite different from those in Australia, as daytime temp were high, humidity was low, and considerable daytime dust necessitated a shorter sampling period. Despite differences, the pattern of spore release was similar, with peaks in the early afternoon and low numbers at night.

The spore-release pattern of *U. necator* essentially was the same as that reported for *Erysiphe polygoni* (4, 6). These are closely related species with conidia borne solitarily. Most powdery mildews that have been studied have a daytime pattern (4, 7). The only possible exception is *E. graminis*, which has diurnal periodicity in the field (2, 5), but none under controlled conditions (3, 4).

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