

**Studies on the biology of the**  
***Hevea* isolate of *Colletotrichum acutatum***

Simmonds ex Simmonds

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## ABSTRACT

The fungus *Colletotrichum acutatum* Simmonds ex Simmonds is distributed worldwide causing diseases in a number of economically important crops including *Hevea brasiliensis*. Further, the anthracnoses caused by this fungus in both temperate and tropical environments are becoming increasingly important. Taxonomic and genetic variations of *C. acutatum* have been extensively studied. In order to assess the pathogenicity of this fungus, detailed information on the biology is required as no literature on these aspects on the rubber or any other isolate of the pathogen is available. Therefore, the objective of this investigation was aimed to study the biology and the pathogenicity of *C. acutatum*.

The fungus sporulated freely on PDA, at temperatures between 10-40°C with two peaks, one around 15°C and the other at 25°C. Self-inhibition of spore germination occurred at spore concentrations above  $80 \times 10^5$  spores ml<sup>-1</sup>. UV radiation at 254 nm inactivated the spores. Spore germination was around 90% at temperatures between 15-35°C. Free water promoted spore germination but was not essential for growth; a high relative humidity (95%) was sufficient. It was observed that the most favourable conditions for the growth and sporulation of *C. acutatum* are prevalent in the major rubber growing areas in Sri Lanka, especially during the monsoons.

All isolates of the fungus examined, secreted in culture polygalacturonase (PG), pectin lyase (PL) and the cellulolytic enzymes,  $\beta$ -glucosidase and cellobiase. Molecular weight determinations suggest that PG as well as the PL produced by all isolates were similar. PG showed a molecular weight of 32,000 and the molecular weight of PL was around 24,000. PG activity was absent in infected rubber leaves. PG inhibitors were not detected in leaf tissue. However, PL activity was confirmed in infected leaves. The detection of PL in leaf tissue was associated with the enlargement of lesions.  $\beta$ -glucosidase was present in both healthy and infected leaves, while cellobiase was detected only in infected leaf tissue.

Significant variations in pathogenicity existed among the six isolates of *C. acutatum*. isolate Av1 was the most virulent and Kt5 the least. In the clonal screening of *Hevea brasiliensis*, using the detached leaf method, the results showed that the isolates of *C. acutatum* behaved differently, in different clones of *Hevea*.