

## **PREFORMED AND INDUCED CHEMICAL RESISTANCE IN THE TEA PLANT AGAINST *EXOBASIDIUM VEXANS* INFECTION**

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HPLC analysis of tea cultivars revealed that the levels of (-)-epicatechin in tea cultivars resistant to blister blight leaf disease were significantly higher than those in susceptible cultivars. The higher levels of epicatechin suggest that it is involved in the resistance of the tea plant against blister blight.

The content of the methyl xanthines, caffeine and theobromine in the tea leaf was found to increase significantly in the initial translucent stage of the disease, probably as a defence response of the plant to fungal attack. Epicatechin and epigallocatechin levels were significantly less at this stage when compared with healthy tissues, but the observed increases in their gallate esters suggest that they were being converted into esters. Although epicatechin levels decreased from translucent stage to the mature blister stages, the decrease was found to be not statistically significant.

The decreased levels of epicatechin, epigallocatechin and their esters on infection, the formation of cyaniding and delphinidin on acid-catalyzed oxidation of the blisters and the use of histochemical staining methods for the detection of proanthocyanidins suggested that catechins were being converted to fungitoxic proanthocyanidins as part of the defence mechanism. The very high resistance of the purple green-leaved tea cultivar TRI 2043 is attributed to the additional catechin source provided by anthocyanins present at higher levels in its leaves. Anthocyanidin reductase present in tea leaves is known to convert anthocyanidins, the aglycone form of anthocyanins, into catechins.

Infection of tea leaves by blister blight also resulted in the shift of proanthocyanidin stereochemistry from 2,3 *trans* (e.g. catechin and galocatechin) to 2,3-*cis* (e.g. epicatechin and epigallocatechin) and in increased gallic acid esterification of the initiating subunits of proanthocyanidins. This was shown both by positive ion MALDI mass spectroscopy and by the acid hydrolysis of purified proanthocyanidins in the presence of phloroglucinol.

It is possible that the increased resistance of some tea cultivars to blister blight is the result of the presence of higher levels of epicatechin or a changed proanthocyanidin composition.