

PROJECT TITLE

Early detection of fungal infections in cowpea plants using computer vision and spectral imaging systems

CONSORTIUM

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SUMMARY OF THE REPORT

The main aim of this transnational access experiment was to utilize different imaging modalities (*i.e.* low-cost colour imaging, hyperspectral imaging, multispectral imaging and chlorophyll fluorescence imaging) in addition to x-ray imaging for the improvement of an early detection of fungal infection developed on cowpea (*V. unguiculata*) seedlings by utilizing the plant phenotyping facilities in INRA, Angers (PhenoPlant installation of PHENOTIC platform) for high throughput monitoring of the growth of cowpea seedlings under biotic stress caused by fungal infections. Due to the current epidemic situation of COVID-19 all over the world and travel restrictions from some overseas countries, it was only possible to perform some preliminary experiments of the proposal for investigating the potential of imaging phenotyping facilities available in the PHENOTIC platform for evaluating cowpea seeds under biotic and abiotic stresses. These experiments were carried out in Angers by the PHENOTIC team, on behalf of Dr. Gamal ElMasry but under his guidance. Different sorts of images (RGB images, spectral images and X-ray images) have been collected from cowpea seeds and relevant image features have been collected and analyzed using multivariate analysis models. The results obtained are very promising indicating high potential of the proposed methods in the discrimination among normal and abnormal seeds. When the whole experiments are performed, the outcome of this access could be disseminated in a peer reviewed journal and international conferences.