



UMP RESEARCH TEAM DESIGNED A GRADING MACHINE FOR AGARWOOD

The initiative began in 2006, with the cooperation of agarwood operators in Gua Musang and the Orang Asli in Kedaik, Rompin.

A group of researchers from Universiti Malaysia Pahang (UMP) has devised an agarwood grading machine called Agarwood Detector System.

Lead researcher and UMP's Centre of Excellence for Bio Aromatic Research Director, Associate Professor Dr. Saiful Nizam Tajuddin said the detector system was the result of a research work carried out with Dr. Muhammad Najib Sharfi from Faculty of Electrical & Electronics Engineering.

Dr. Saiful Nizam Tajuddin, 39, said the study was to classify and determine the quality of wood or agarwood oil based on Case-based Reasoning (CBR) that was developed together with chemical sensor arrays.

The initiative began in 2006, with the cooperation of agarwood operators in Gua Musang and the Orang Asli in Kedaik, Rompin.

In due course, they designed the system which was a Smart Classification Tool to determine wood quality using the odour profiling technology.

"Through this technology, odour sample will be taken from wood or oil that has been identified by an expert and by means of olfactory gas chromatography.

Then, a few samples of the same quality will be taken over a fixed and consistent period of time.

"Once the unique smell of every wood sample is taken, odour profiling of each wood is kept in chemical sensor arrays or E-nose," he said.

He added that it would be stored as a case and each odour quality had different cases.

After the odour sample and profiling was done, the E-nose would be used to detect unidentified samples and the odour of the same properties of the kept profile would be retrieved as the scent of the same wood.

Similarly, if an odour profile that needed to be detected had a far more similar percentage, the sample would also be ascertained based on the case contained in the E-nose.

Dr. Saiful Nizam said manipulation in the grading of oil/wood quality in the market moved him to come up with the idea by combining knowledge in chemistry and sensors.

"Sensors available in the market have been using different Artificial Intelligence techniques.

"These tools are expensive and we have managed to come up with a locally-produced

device that is more accurate in its analysis and much cheaper in the market with the assistance of UMP undergraduates," he added.

Dr. Muhammad Sharfi Najib said to classify and determine the quality of wood or agarwood oil based of a collection of various cases were identified by experts and that, each odour profile from different samples were classified as a different case.

He added that various different cases from different odour samples that had been identified by experts would be kept in a case library and with each testing that used E-nose, CBR was able to distinguish the different wood scent quality.

All of the processes would be loaded in the E-nose microcontroller that had been designed accordingly, he said.

"Currently, operators are forced to use the conventional method that is based on physical properties such as density, colour and physical form," he said.

Dr. Saiful Nizam also said the final objective of the project was to detect agarwood resin in the Karas trees.

At the moment, Karas trees would have to be carved or cut down to obtain new resin and

as such, it would be risky for agarwood operators if the trees harvested did not produce resin, he added.

For future plans, he hoped that the detector system could be further improved so that the size would be smaller, use lesser power and portable, and easier to be taken to even remote places.

He also said the research work received cooperation from agencies and departments and obtained research grant funds from Ministry of Higher Education (FRGS) and Ministry of Science, Technology and Innovation (MOSTI).

On the cost estimation, Dr Saiful Nizam said he had yet to fix the price but had already filed a patent for the innovative product.

He hoped this grading standard that verified the quality of oil or agarwood could be the yardstick that was based on scientific studies and as such, manipulation on purity and price could be better controlled.

The product has also received many international awards and recognitions including gold medals at the Invention and New Product Exposition (INPEX) 2015 and International Innovation Exhibition ITEK 2014.