

Tougher, lighter and stronger than synthetic fibres

BY AZMAN ZAKARIA/UPM

UNIVERSITI Putra Malaysia (UPM) researchers have successfully created unmanned aircraft (UAVs) or drones from natural fibres that have electrical resistance.

The drone named Putra Unmanned Aerial Vehicle or Putra UAV is the first of such innovation to use natural fibres or biocomposite from pineapple leaves. It can fly up to about 30 metres and can be in the air for about 20 minutes.

With the special feature of having electrical resistance, the fibre can prevent short circuits and can be easily repaired in the events of minor damage.

The head of the research team, Prof Ir Ts Dr Thariq Hameed Sultan said the Putra UAV main structure consisted of a skeleton made of natural fibres. Other features on the drones are rechargeable motors, blades and batteries.

According to him, most drones are currently made of plastic, carbon fibre and aluminum which are categorised as synthetic fibres.

By comparison, he said, drones made from natural fibres or biocomposites have a higher strength ratio based on weight than drones from synthetic fibres, as well as cheaper, lighter, and natural fibres are readily available, with low electrical conductivity.

"Therefore, biocomposites have an amazing potential to replace existing materials. Biocomposites are light and environmentally friendly. Due to their biodegradation factors, they can easily decompose and be disposed off in the soil," he said.

He said the idea of creating a drone from the natural fibre of the pineapple leaf was initiated during a community project in Teluk Panglima Garang, Selangor in 2017 when the village head asked UPM to help dispose leftover pineapple leaves from harvest.

According to the village head, previously the pineapple leaves in the village would only be piled up and left to rot — which sometimes could nest poisonous animals such as snakes, centipedes and also monitor lizards — or simply burned, which can cause pollution.

Thariq, a lecturer in UPM's Aerospace Engineering Department, therefore applied for research funds and obtained RM25,000 from UPM to develop machines that can convert the pineapple leaves to fibre.

With the innovation, Thariq explained that 300gm of pineapple leaves can produce four fibre 'plate' to make drones. "The production of Putra UAV thus successfully utilises the use of pineapple leaves," he added.

He added that the drones can be used for air monitoring purposes, spraying pesticides for agricultural activities, or simply to fly as a hobby. The production is expected to further elevate UPM in the field of agriculture.

The production of the drone is under the National Blue Ocean Strategy, which also involves a researcher from

Universiti Tun Hussein Onn Malaysia (UTHM) and one from Malaysia UAV Drone Activist Society (Mudas).

The research team comprised Dr Ain Umaira Shah, Dr Syafiqah Nur Azne Sali, Muhammad Imran Nazerb, Ts Edyazuan Azni, Dr Adi Azrif Basri, Dr Ahmad Hamdan Adifin, Luifi Tawil from UPM, together with Prof Dr Yusri Yusof (UTHM) and William Robert Alvase (Mudas).



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