

REVIVING THE TRADITIONAL GINGERLY OIL PRODUCTION ('SEKKU') TECHNOLOGY USING SOLAR POWER

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Gingerly oil (GO) is highly valued for its therapeutic value. To retain which, GO should be expressed from gingerly seeds by crushing them at mild conditions which prevail in the traditional GO production ('sekku') technology powered by a bullock. It is noteworthy that the maximum pressure in a 'sekku' is about 10 bars which is much lower than the pressures prevailing in a large modern expeller or in a small screw-press. Scooped circular pit in the central fixed wooden chamber of the 'sekku' acts as a mortar and holds the gingerly seeds. A stout wooden pestle is used to crush the seeds and then squeezing out the oil from the seeds. The pestle is turned inside the mortar by a load-beam, one end of which rides around the outside of the stationary mortar and the other end is set in circular motion by the bullock. Today, bullock is replaced by diesel-fuelled tractors, such as Kubota K75, primarily for convenience. Circling motion of the tractor results in highly inefficient fuel use, which in turn results in unwanted greenhouse gas emissions. Moreover, diesel exhaust, which contaminates the gingerly oil produced, contains carcinogens. In this study, we have designed a system using photovoltaic cells to solar power the 'sekku'. We propose a system in which the traditional wooden mortar of the 'sekku' is retained, and the wooden pestle-driving mechanism is modified as follows: attach a camshaft mechanism to the pestle; drive the camshaft mechanism using an AC motor; power the motor by solar photovoltaic cells via an energy saving variable frequency drive (VFD). VFD provides the steady speed controls for the motor, thereby regulating the speeds of the oil expeller at required levels. Using the proposed solar-powered "sekku", mild operating conditions required to ensure production of GO with therapeutic values can be ensured, which gives added market value to GO. Besides, surplus solar electricity can be supplied to the national power grid during off-seasons of GO production. We plan to implement the proposed system on a demonstration 'sekku' unit in the Northern peninsula in near future.

Keywords: Gingerly oil, Photovoltaic, Sekku, Sesame oil, Solarpower

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