

RESEARCH NOTE

Extraction of Fibres from Oil Palm Empty Fruit Bunches

Oil palm empty fruit bunches, a by-product of oil palm processing industry is presently disposed in the mill site, which creates environmental problems. In some places dried empty fruit bunches (EFB) are used as fuel for boilers in the processing mill for steam generation but the economic use of it has not been reported so far in India. An attempt was made to extract the fibres from oil palm empty fruit bunches and it was found that oil palm empty fruit bunches were rich source of fibres. These fibres can be utilized for value added products like medium density particle fibre boards (Volker, 1998), thermal insulating materials, sound proofing materials, packaging materials (Andy, 1998), fillers for bio degradable plastic packaging (Basuki and Purboyo, 1998), rubberized mattresses, (Anonymous, 1996) etc.

The fibre extraction from the EFB was attempted initially in a combing machine used for extraction of fibres from palmyra leaf base, agave etc. (Fig.1). Individual EFB were fed to the combing machine by holding the stalk of the empty bunch. The bunches were subjected to combing action by the nails provided on the rotating drum of the fibre extracting machine. But this process was very tedious,

as the separation of fibres by combing action was difficult because of the narrow gap between the rotating drum and the outer wall. Moreover the size of the bunch being larger, pushing it into the machine was difficult. For easy removal of fibres, the bunches were flattened manually by beating action and then fed in to the machine. This process could separate the fibres to some extent, but it was unsuitable for large scale fibre extraction from empty bunches.

For large scale extraction of fibres from oil palm EFB the fibre decorticator machine used for coir extraction from coconut husk was employed. The fibre decorticator consists of a cylindrical drum of size 180 x 90 cm dia mounted on a central shaft provided with blades. The blades were welded to the shaft with a spacing of 30 cm and the shaft was fixed with slight slope towards the outlet port to facilitate the movement of empty bunches towards the outlet. A 25 HP motor running at a speed of 1400 rpm rotated the shaft (Fig.2).

The empty fruit bunches were soaked in water for two days for easy separation of fibres. The bunches were drained from water and fed through the feed inlet into the cylindrical drum. In the decorticator the bunches were subjected to the beating action of the blades provided on the rotating shaft, which helped in separating the fibres. The separated fibres were collected through the fibre outlet.

It was also observed that feeding bigger size EFB into the decorticator was not possible because of choking

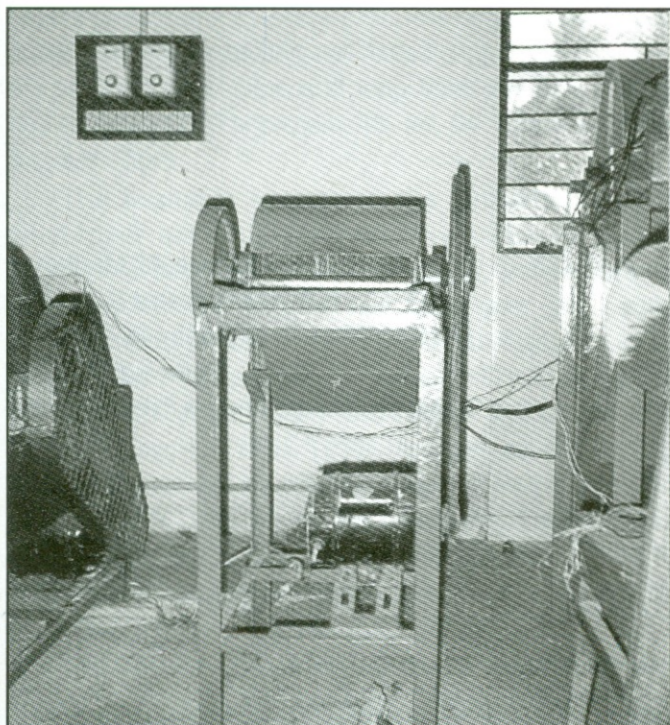


Fig. 1: Combing machine

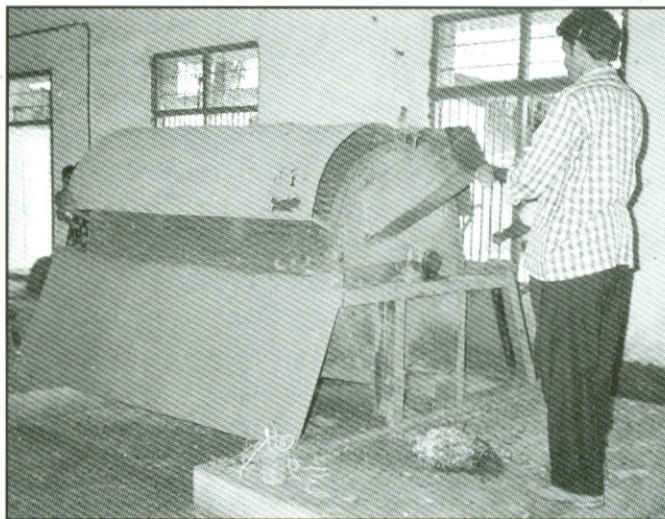


Fig. 2: Fibre decorticator

of the fibres inside the drum. The reasons for choking was mainly due to the lower motor capacity and lesser beating effect on the bunches and hence only small size empty bunches (from FFB of less than 10kg) were fed in to the fibre decorticating machine for extraction of fibres. The fibres were collected at the outlet in less than one minute. The extracted fibres were sundried thereafter. It was found that empty bunches at an initial moisture content of 21.42 per cent produced 36.95 percent of dry fibres. The oil palm fibres extracted from EFB with the fibre decorticating machine have the following properties:

Length of the fibres	:	10- 22 cm
Moisture content	:	11. 20 %
Oil content (retained in the sun dried fibre)	:	3.05 %
Bulk density g/cc	:	1.02
Colour	:	light brown

The fibres after cleaning in a willowing machine were tested for making yarn in motorized rhat. The breakage of fibres in the decorticating machine caused difficulty in yarn making due to varying lengths of the fibres. To over come this, coconut fibres were blended on 10 to 20 per cent of oil palm fibre weight basis to get continuous yarn.

However it was found that the coconut fibre decorticator needs modification for effective and large scale extraction of fibres from larger size empty bunches of oil palm with less breakage of fibres. Modification of the existing coconut decorticator is being carried to suit the requirements of oil palm EFB. The modified design consists

of a cylindrical drum of length 270 cm and diameter 90 cm. The blades are provided on the shaft at an interval of 45 cm and the motor capacity is increased to 30 HP. This may help to prevent the choking of fibres inside the drum and also to reduce the breakage of fibres.

ACKNOWLEDGEMENTS

The authors acknowledge Dr.P.Rethinam, Chairman, Coconut Development Board, Kochi for his valuable technical advice, the Coir Board Regional Station, Rajahmundry, East Godavari District, Andhra Pradesh and Krishi Vigyan Kendra, Central Tobacco Research Institute, Rajahmundry for providing the facilities.

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