

YEAR	ACTIVITIES	ACHIEVEMENTS
1960-61	Deputed the Senior Research Asst. (Tech) to the Central Coconut Research Station, Kayamkulam to work on the chemical and biological retting of coconut husks for extraction of coir and investigation on the recovery of certain organic chemicals from coir pith.	Studies initiated on chemical and biological retting of coconut husks
1961-62	<p>Studies on the effect of a few selected chemicals on the retting of husks indicated that the following ten chemicals were highly useful from the point of view of the yield of the fibre obtained</p> <p>1) Sodium phosphate 2) Ammonium carbonate 3) Citric acid 4) Sodium oxalate 5) Ammonium phosphate 6) Potassium monophosphate 7) Ammonium tartarate 8) Potassium phosphate (tribasic) 9) Ammonium oxalate 10) Potassium phosphate (monobasic).</p> <p>Bio-chemical retting: -</p> <p>Comparative growth of the organisms was determined by inoculating colloidal suspension of each culture (10 fungi) into four media of different carbon sources and it was found that in general better growth of the mycelia was there (adjudged on the basis of the weights of dried mycelium), when the fungi were grown in Czapek Dox Salt solution incorporated with coconut pectin.</p>	<p>1. Carried out chemical retting of coconut husks with 10 chemicals.</p> <p>2. Various enzymes were applied for understanding retting mechanism.</p>

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	<p>Determination of the enzyme activity of each culture, as observed on the basis of the fall in viscosity of a standard coconut pectin solution when mycelia extracts and culture filtrates were incubated with it, revealed that <i>Mucor</i> sp. and one species each of <i>Penicillium</i> and <i>Fusarium</i> showed remarkable pectinolytic property, <i>Aspergillus niger</i>, <i>Aspergillus</i> sp., <i>Mycelia sterilia</i> and <i>Aspergillus clavatus</i> were in the descending order.</p> <p>Studies on the effect of pH on enzyme activity using Phthalate, Phosphate and Borate buffers of pH varying from 2-10 indicated that enhanced activity was shown by those possessing pectinolytic property, at a pH of 5, 6 and 7 [activity being highest at pH 6.0], practically no activity was shown at pH 2, 9 and 10</p> <p>A study on the effect of the period of incubation on enzyme activity revealed that enzyme activity was marked after the first six hours of incubation.</p> <p>Retting liquors and husks retted to different months were collected from two retting areas viz. Vayalar and Thanneermukkom, of Kerala and fungi and bacteria isolated as pure cultures by standard techniques. The anaerobic behavior of the bacterial cultures was studied and anaerobes isolated using Robertson's cooked meat media. However they could not be separated as individual cultures owing to the non-availability of a Macintosh and Fildes Jar.</p> <p>Various methods of extraction of pectin from plant materials were being tried on coconut husks with a view to evolve satisfactory method for extraction of coconut pectin.</p> 	

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1962-63	<p>A satisfactory method was standardised for extraction of pectin from coconut husks by standard ammonium oxalate solution followed by precipitation with alcohol. Pure cultures of bacteria and fungi isolated from the retting sites were subcultured in laboratory. Experimental investigations were carried out for the evaluation of hemicellulose in coconut husks.</p> <p>Studied the loss in weight of the pith on acid/ alkali treatment.</p> <p>As a prelude to survey a few selected retting areas producing different varieties of coir yarn, retting liquor and retted husks from four sites were collected for further study to determine the optimum period of retting to give good quality fibre, yield of fibre, pith content and quality of fibre and yarn.</p> <div data-bbox="1062 402 1455 704" data-label="Image"> </div> <div data-bbox="1094 727 1430 797" data-label="Caption"> <p>Traditional fibre extraction by hand beating</p> </div>	<p>1. Standardised a method for extraction of pectin from coconut husks using ammonium oxalate.</p>
1963-64	<p>Surveyed the retting sites at places producing Anjengo, Mangadan, Ashtamudi and Alapat yarns and observed the differences in mode of retting and factors influencing retting like quality of husks, quality of water, seasonal variation and period of soaking, pH and temperature conditions. The colour of fibre and yield of fibre and pith were also noted.</p> <div data-bbox="1180 954 1430 1154" data-label="Image"> </div> <div data-bbox="1184 1182 1430 1219" data-label="Caption"> <p>Traditional Retting</p> </div>	

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1967-68	Efforts were made for taking up investigation on theoretical aspects of retting in collaboration with Indian Institute of Science, Bangalore.	
1968-69	Extracted coir from tender coconut husks by crushing the husks prior to the retting process and retting the husks for a period of about 2 to 3 months but the yield was very poor compared to the fibre extracted from mature green husk by the traditional retting process.	
1969-70	<p>Crusher was procured and installed for crushing of husk prior to soaking in water in cement tanks for a period of 6 weeks with uncrushed husk as the control. It was observed that the softening effect was very much pronounced with crushed husk than that obtained with the uncrushed husk. The colour of the husk retted in cement tank was not satisfactory.</p> <p>Preliminary investigation in retting of coconut husks in tubs indicated that the phenolic ingredients of the husks had to be eliminated for the most part for stepping up the pectinolytic activity.</p>	1.A Crusher was procured and installed.