Biodegradable polymers can potentially be combined with plant fibres to produce biodegradable composite materials. In our research, a commercial L-polylactide was converted to film and then used in combination with jute fibre mats to generate composites by a film stacking technique. Composite tensile properties were determined and tensile specimen fracture surfaces were examined using environmental scanning electron microscopy. Degradation of the polylactide during the process was investigated using size exclusion chromatography. The tensile properties of composites produced at temperatures in the 180-220 degreesC range were significantly higher than those of polylactide alone. Composite samples failed in a brittle fashion under tensile load and showed little sign of fibre pull-out. Examination of composite fracture surfaces using electron microscopy showed voids occurring between the jute fibre bundles and the polylactide matrix in some cases. Size exclusion chromatography revealed that only minor changes in the molecular weight distribution of the polylactide occurred during the process. (C) 2003 Elsevier Science Ltd. All rights reserved.