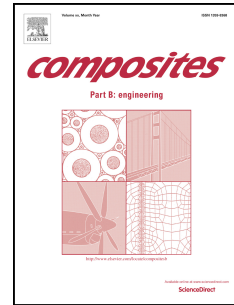


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## Fully Biodegradable Composites Based on Poly(butylene adipate-co-terephthalate)/Peach Palm Trees Fiber.

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### Abstract:

Lignocellulose agricultural residue from peach palm trees (*Bactris gasipaes kunth*), also well-known as “pupunha”, was employed as reinforcing filler of biodegradable matrix based on poly(butylene adipate-co-terephthalate) (PBAT) in order to develop new green composites for food packaging applications. Then, milled fibers (1.6 mm) were prepared with or without surface treatment with glycidoxypopyl-trimethoxy silane (GPTMS) and introduced into PBAT matrix. The mechanical, dynamic mechanical and rheological properties of these composites were investigated. The presence of fibers, mainly the functionalized one led to an increase of the mechanical performance of the corresponding composites. Finally, the preparation of polymer composite foams for possible packaging applications was also investigated under supercritical carbon dioxide (ScCO<sub>2</sub>) which acts as environmentally friendly blowing agent. The foamed materials were characterized by SEM microscopy and creep-recovery testing.

**Keywords:** A. Fibres; A. Polymer-matrix composites (PMCs); B. rheological properties; D. Mechanical testing; A. biodegradable composite.

### 1. Introduction

Biodegradable polymers have been widely studied and reported as eco-friendly alternatives of conventional thermoplastics in agricultural and packaging industries to reduce the environmental impact of plastic waste. Poly lactic acid (PLA) and poly(hydroxyl-alkanoates) (PHA) are two excellent examples which are obtained from renewable resources. However, the relatively high cost and brittleness (mainly PLA) limit some

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