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A Preliminary Study on Muscle Activation during Simulated Walk & Carry Task in Palm Oil Plantation

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Abstract
This paper presents an electromyography (EMG) analysis of EXOROBO, a newly developed exoskeleton designed specifically for palm oil harvesting tasks to reduce Musculoskeletal Disorders (MSDs) among palm oil harvesters. The study evaluates the muscular activity patterns of individuals operating EXOROBO & CANTAS™ compared to the harvesting method by using CANTAS™. This research seeks to provide valuable insights into the ergonomic benefits and biomechanical implications of employing EXOROBO in palm oil harvesting operations through EMG measurements. Results indicate a significant reduction in muscle activity in four key muscle groups; left Biceps Brachii (L_BB) by 51.30%, left Rectus femoris (L_RF) by 44.61%, right Biceps Brachii (R_BB) by 23.98% and right Rectus Femoris (R_RF) by 7.17%. The findings of this study contribute to the ongoing discourse on the development of ergonomic solutions for agricultural labour, particularly in addressing the prevalent issue of MSDs in the palm oil industry. © Published under licence by IOP Publishing Ltd.

Author Keywords
EMG analysis; EXOROBO; exoskeleton; Musculoskeletal Disorders (MSDs).; palm oil harvesting

Index Keywords
Ergonomics, Exoskeleton (Robotics), Harvesters, Joints (anatomy); Biceps brachii, Electromyography analyze, EXOROBO, Exoskeleton, Muscle activation, Muscular activities, Musculoskeletal disorder ., Musculoskeletal disorders, Palm oil harvesting, Rectus femoris; Electromyography

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