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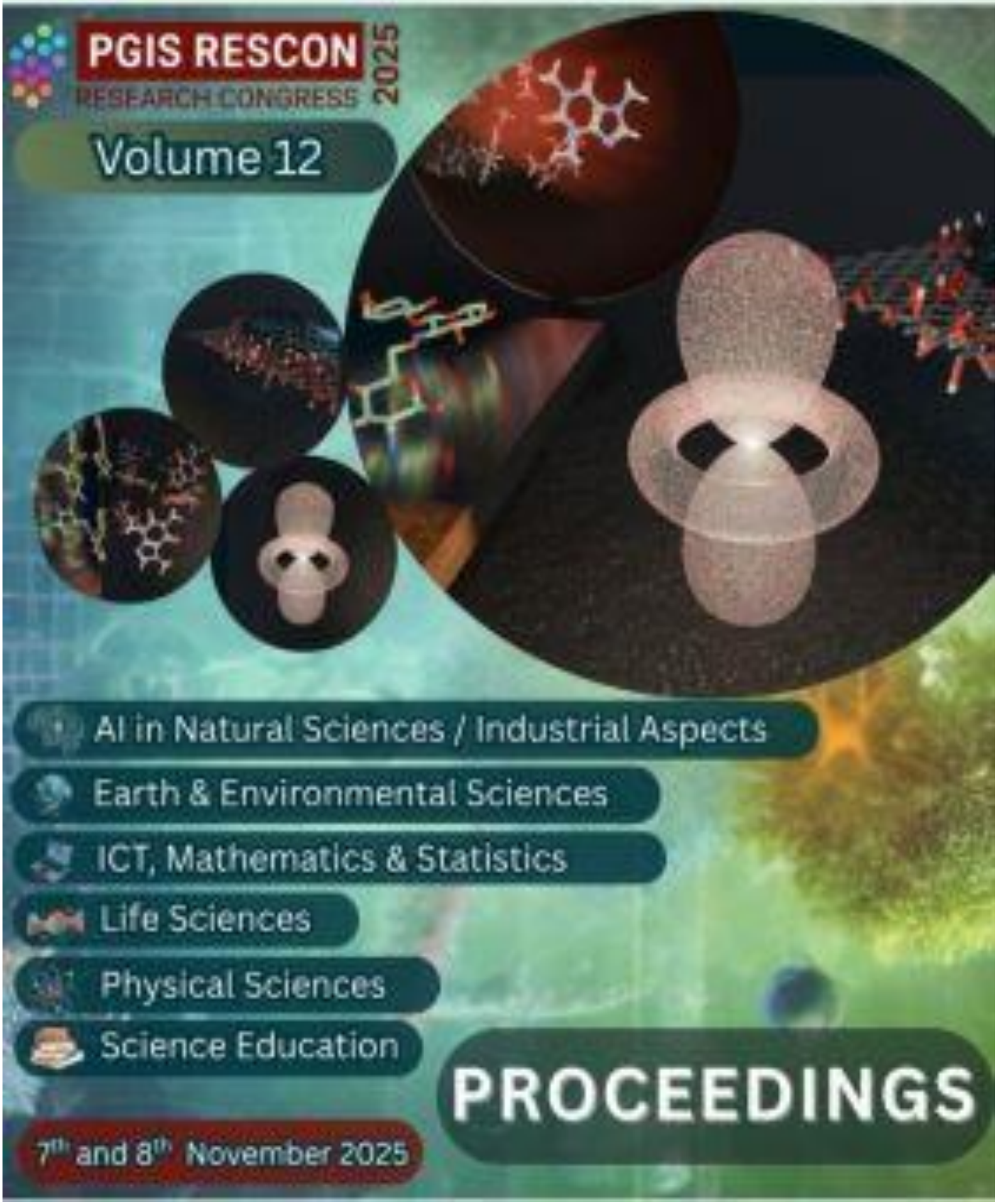

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NOCTURNAL BEETLE ASSEMBLAGES AND THEIR TAXONOMIC AND FUNCTIONAL DIVERSITY ACROSS SUB-MONTANE HABITATS IN RIVERSTON, SRI LANKA

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Beetles represent a significant portion of Sri Lanka's insect fauna. However, little is known about how their diversity patterns and ecological functions vary across sub montane habitats. In this study, the diversity and the functional structure of nocturnal beetle assemblages across three habitat types, central forest (CF), forest edge (FE) and grassland (GR), were investigated in Riverston, northern Knuckles Conservation Forest. Field surveys were conducted during 2019 and 2020, including dry and rainy seasons using UVlight traps (total 72 trapping events). Beetles were identified to family level and classified into six feeding groups (Herbivores, Predators, Scavengers, Fungivores, Moss feeders, and Xylophagous). Assemblages were analysed for taxonomic and functional diversity using abundance data. In total, 10,133 beetles from 65 families were recorded. FE supported the highest abundance and richness (44.52%, 58 families), followed by CF (35.72%, 56) and GR (19.74%, 46). The most common family was Staphylinidae in FE (18.4%) and GR (24.7%), while Pselaphidae dominated in CF (43.8%). Shannon and Pielou indices showed no significant differences (FE; H' = 2.58, J = 0.23, CF; H' = 2.30, J = 0.18, GR; H' = 2.55, J = 0.29; p = 0.3679), indicating stable alpha diversity. However, Bray-Curtis dissimilarities revealed moderate beta diversity between habitats (CF–FE = 0.61, CF–GR = 0.59, FE–GR = 0.46). CF had the highest functional richness (4.82) and RaoQ (0.72), while FE showed the highest divergence (0.71) indicating the presence of functionally distinct taxa. FE had the most even functional distribution (0.75). NMDS of functional composition revealed distinct separation between CF and GR (73.2% dissimilarity). This study highlights that habitat structure plays a critical role in shaping the functional composition of beetle communities, even when taxonomic diversity appears stable. These findings underscore the importance of conserving a mosaic of habitats to ensure the maintenance of overall beetle biodiversity. A future study will extend to additional submontane locations to assess the consistency of these patterns across a broader spatial scale and further inform habitat-based conservation strategies.

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