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DEPOSITIONAL CHARACTERISTICS OF SEDIMENTS FROM MIRES IN AND AROUND HORTON PLAINS NATIONAL PARK, SRI LANKA

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Horton Plains National Park (HPNP) is a wetland plateau located in the central highlands of Sri Lanka. It serves as the headwaters for Mahaweli, Kelani and Walawe rivers and comprised with slow flowing watercourses and miers where wet patana grasslands and dwarf-forests are characterized. The present study aims at delineating sedimentation sequence using particle distribution and grain morphometric relationships, since they can be used as indications to determine nature, provenance and transportation. Three Russian corer samples inside HPNP and 14 undisturbed core samples from the adjacent regions of Ambewela (AMB), Pattipola (PTP), Thotupola North and Kotagala (KTG) were collected. Core samples were sliced into 1cm sections, however, every 5cm interval was analyzed using laser granulometer with the size range of 0.1-1000µm. Particle size distribution was measured using Fork and Ward (1957) method with GDADSTATv.8 program. With depth, the mean particle size ($\bar{X}$) of the samples falls to coarse silt (CSi) to medium silt (MSi) ranges. For AMB sections $\bar{X}$ varies from CSi (0-25cm) - MSi (30-40cm) - CSi (45-65cm) to MSi (70-100 cm) whereas for PTP section $\bar{X}$ varies from CSi (0-25cm) - MSi (30cm) - CSi (35-45cm) - MSi (50cm) - CSi (55-95cm) MSi (100-120cm) to CSi (125-135cm) which indicate a rhythmic depositional nature. Meanwhile, for KTG, $\bar{X}$ gives MSi (0-135cm); indicating a consistent depositional environment. All samples show very poorly sorted and very fine skewed particle distributions within the sequence of deposition under mire environment. Kurtosis for particle distribution shows leptokurtic (K>0) and mesokurtic (K=0) for CSi while platykurtic (K<0) for MSi. Particles separated through 1mm and 2mm sieves were washed, cleaned and analyzed using optical microscope to observe grain morphology. Quartz grains show angular shape, sharp edges, breakages, pitted surfaces and conchoidal fractures which may have resulted with grain-to-grain contact as in glacial sediments. However, this could be evidence for reduced transportation. Grain size distributions of AMB and PTP sediments show S shape trend from slightly silty sandy clay - sandy silty clay to slightly sandy silty clay in the SSC trigon of Blott and Pye (2012). On the contrary, KTG sediments singularly disseminated within slightly silty sandy clay. These observations suggest that AMB and PTP had undergone a rhythmic sedimentation history under an identical depositional environment whereas KTG sediments deviate from that nature. Moreover, some samples from AMB plotted away from the S shape trend which could be due to mechanical reworking of the top soil for agricultural and animal husbandry around the area. Further investigations are planned in order to scrutinize the depositional environments of HPNP, PTP, AMB deposits and to establish the chronology using palynological investigations.

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