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Amino acid and peptide profile in Sri Lankan samples of milk, whey, digested milk and curd using paper chromatography

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The type and concentration of amino acids and peptides liberated during fermentation of milk varies depending on the bacterial strain and the type of milk. These have many biological activities such as anti-hypertensive and anti-oxidant activities. This study was carried out to compare the differences in amino acids and peptides of milk, whey, digested milk and curd of Sri Lankan samples.

Two different brand curd samples were centrifuged and whey fractions (W_1 & W_2) were obtained. 2 g of milk and curd samples from Brand 1 were digested with pepsin (pH=1.5) followed by pancreatin (pH=7.8). On chromatography paper milk (M_1), W_1 & W_2 , digested milk (DM_1) and curd (DC_1) were spotted and separated using n-butanol:ethanol:ammonia (7:3:4) solvent system. Spots were visualized after treating with ninhydrin.

Samples were matched with the nine spots obtained for the standard amino acid. Sample W_1 , W_2 , DM_1 and DC_1 showed eight spots with varying intensity where the upper six spots matched with the standard amino acids and an additional two spots were observed below the standard amino acid indicating smaller peptides (Fig.1). All samples had intense yellowish purple spots indicating smaller peptides with proline. W_2 gave a more intense yellowish purple spot compared to W_1 . Three spots, most likely to be smaller peptides, were seen in M_1 . Broader spots were observed in DM_1 and DC_1 compared to whey. Most intense and broadest spots were observed in DC_1 . All samples showed purple at the spotting position indicating larger peptides and proteins. This indicates that even though both whey fractions consist of similar amino acids, the quantity of the active peptides might differ in concentration. The digested samples had a high amount of amino acids and small peptides compared to the fresh milk and whey fractions, but the peptides and amino acid concentration in digested curd was very high compared to the digested milk indicating that fermentation leads to a different amino acid and peptide profile.

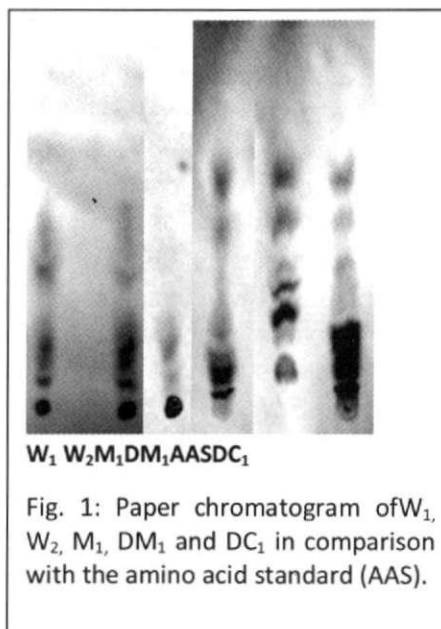


Fig. 1: Paper chromatogram of W_1 , W_2 , M_1 , DM_1 and DC_1 in comparison with the amino acid standard (AAS).