Abstract

Raw and pressure-cooked tender pods of mangrove wild legume Canavalia cathartica of southwest coast of India were evaluated for proximate and mineral composition, protein and carbohydrate fractions, amino acid and fatty acid profiles, antinutritional factors, in vitro protein and starch digestibility in comparison with ripened beans. Proteins of raw (23.3%) and cooked pods (14%) are similar or more than seeds of many wild legumes. Pods are poor source of crude lipids (1.1-2.3%). The pod fiber (11.1-15.3%) is remarkably more than ripened beans (8.3-9.1%) and dry seeds (2.5%). Crude carbohydrates of pods (54.2-69.8%) are lower than ripened beans (58.5-73.3%), but cooking elevated its content. The calorific value of pods is less than ripened beans (1383-1444 vs. 1516-1517 kJ 100 g−1). Mineral constituents of the raw and cooked pods are comparable with ripened beans. In pods, Ca is high (246-382 mg 100 g−1) followed by Mg (95-109 mg 100 g−1). Cooking drained minerals in pods as well as ripened beans, but unlike other minerals, Se did not (12.9 vs. 12.6 mg 100 g−1). Mg, Zn and Mn of both raw and cooked pods surpass the NRC/NAS requirement for infants. The true protein is higher in raw pods than cooked pods (17.3 vs. 11.4%) as in ripened beans (21.9 vs. 12.5%). Among protein fractions, globulins are highest (6.6%) followed by albumins (5.6%) in raw pods similar to ripened beans. Non-protein nitrogen is more in pods than ripened beans (0.4-1 vs. 0.2-0.6%). Starch is a major carbohydrate fraction in pods (34.6-49.3%) as well as ripened beans (44.7-52%), which is further elevated on cooking. Total and reducing sugars are higher in raw pods than ripened beans, while non-reducing sugars in raw ripened beans. Among essential amino acids (EAA), threonine, valine, isoleucine, leucine and lysine in raw and cooked pods, phenylalanine and histidine in raw pods surpassed FAO/WHO/UNU recommended pattern for adults. Histidine of raw pods (2.15%) surpassed the FAO/WHO recommended pattern (1.9%). The sum of saturated fatty acids, polyunsaturated fatty acids and essential fatty acids were higher in raw pods. Among essential fatty acids, raw pods possess linoleic and linolenic acids, while cooked pods linolenic and arachidonic acids. Tender pods are devoid of trypsin inhibitors, while total phenolics, orthodihydric phenols and tannins of raw pods decreased considerably on cooking. The phytohemagglutination activity of raw pods lowered on cooking. As in vitro protein digestibility, protein digestibility corrected to EAA score of pods was not encouraging and reflects interference of antinutritional factors. The in vitro starch digestibility of pods doubled on cooking (maltose: 1.3 vs. 2.6 mg hr−1 100 g−1).
Keywords
Canavalia cathartica, wild legume, tender pods, nutritive value, digestibility.