Yam is a significant and highly prized starchy crop in West and Central Africa but it is largely underutilized industrially. Functional and physicochemical properties of starches extracted from forty-three varieties of five species of yam; Dioscorea roundata, D. alata, D. dumentorum, D. cayenensis and D. bulbifera were investigated to determine their potential industrial utilization. Water binding, swelling, gelation capacities, granule size amylose/amylopectin, pasting characteristics, paste clarity and syneresis were determined by standard methods. Results showed that there were both intra and interspecific differences in the functional and physico-chemical properties of starches investigated. Granule morphology revealed that starches from D. rotundata, D. alata, D. cayenensis and D. bulbifera had large starch granules (28-50µm) while D. dumentorum had small granules (7-12 µm). There was also variability in the starch granule shapes which were mostly oval, round and triangular. The least gelation end point (LGE) of the starches was between 6-10% with D. bulbifera having the lowest LGE hence could be utilized as a thickener or gelling agent. Paste clarity of the starches decreased as storage days increased and all the starches from the yam species exhibited high syneresis rate indicating tendencies to retrograde on low temperature storage. There was large variability in the pasting characteristics of the yam starches with D. rotundata and D. bulbifera having high peak viscosities. These differences in the functional and physico-chemical properties of the yam starches were identified and were used as indicators of the various products where they can be utilized in both food and non-food applications.

Key words: Yam species, Dioscorea, yam starch, physicochemical functional characterization, industrial utilization.