



Towards developing sustainable method of isolating humic acids from humified materials

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Humified substances such as coal, composts, and peat soils have substantial amounts of humic acids (HA) but the isolation of these acids is expensive, laborious, and time consuming. Factors that affect the quality and yield of HA isolated from these materials include extraction, fractionation, and purification periods. This paper reports part of studies conducted to investigate whether a simple, rapid, and cost effective method could be developed for isolation of HA from humified substances such as tropical peat soils. There was a quadratic relationship between extraction period and HA yield. Optimum extraction period was estimated at 4 h instead of the usual range of 12 to 48 h. There was no relationship between fractionation period and HA yield, as such 2 h (instead of the usual range of 12 to 24 h) fractionation period was considered optimum. Low ash content (5%), remarkable reduction in K, coupled with the fact that organic C, E4/E6, carboxylic COOH, phenolic OH, and total acidity values of the HA were consistent with those reported in the literature suggest that the HA dealt with were free from mineral matter. This was possible because the distilled water used purifying the HA served as Bronsted-Lowry acid during the purification process of the HA. Optimum purification period using distilled waster was 1 h instead of the usual range of 1 and 7 days. Humic acids could be isolated from tropical peat soils within 7 h (i.e. 4 h extraction, 2 h fractionation, and 1 h purification) instead of the existing period of 2 and 7 days. This could facilitate the idea of producing organic fertilizers such as ammonium-humate and potassium-humate from peat soils since techniques

devised in this study in isolating HA did not alter the true nature of the HA. Besides, the technique is rapid, simple, and cost effective (e.g. less time consuming).