

## Electrochemistry and Performance of Bryophyllum pinnatum Leaf (BPL) Electrochemical Cell

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**Abstract :** The study was carried out to investigate on an innovative invention, Pathor Kuchi Leaf (PKL) cell, which is fueled with PKL sap of widely available plant called Bryophyllum pinnatum as an energy source for use in PKL battery to generate electricity. This battery, a primary source of electricity, has several order of magnitude longer shelf-lives than the traditional Galvanic cell battery, is still under investigation. In this regard, we have conducted some experiments using various instruments including Atomic Absorption Spectrophotometer (AAS), Ultra-Violet Visible spectrophotometer (UV-Vis), pH meter, Ampere-Volt-Ohm Meter (AVO Meter), etc. The AAS, UV-Vis, and pH-metric analysis data provided that the potential and current were produced as the Zn electrode itself acts as reductant while  $\text{Cu}^{2+}$  and  $\text{H}^{+}$  ions are behaving as the oxidant. The significant influence of secondary salt on current and potential leads to the dissociation of weak organic acids in PKL juice, and subsequent enrichment to the reactant ions by the secondary salt effects. However, the liquid junction potential was not as great as minimized with the opposite transference of organic acid anions and  $\text{H}^{+}$  ions as their dissimilar ionic mobilities. Moreover, the large value of the equilibrium constant (K) implies the big change in Gibbs free energy ( $\Delta G$ ), the more electromotive force works in electron transfer during the forward electrochemical reaction which coincides with the fast reduction of the weight of zinc plate, revealed the additional electrical work in the presence of PKL sap. This easily fabricated high-performance PKL battery can show an excellent promise during the off-peak across the countryside.

**Keywords :** Atomic Absorption Spectrophotometer (AAS), Bryophyllum Pinnatum Leaf (BPL), electricity, electrochemistry, organic acids

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