Effect of pH of the PKL extract during electricity production

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Abstract

Every liquid has pH value. For neutral liquid the pH value is 7, for alkali the pH value is greater than 7 and for acid the pH value is less than 7. The pH value of water is 7 and that is why is neutral.The results were taken from different PKL modules. It is shown that pH value has been decreased during electricity generation.The pH has been recorded with the variation of time duration. It is also found that the one of the weak organic acids in the PKL extract named malic acid has been increased in the night time. As a result the the performance of the PKL electricity has been increased in the night time rather than day time. A comparative study of the pH value for PKL extract between day and night time. It is found that the performance for night time is better than the day time.

Keywords: *pH value, PKL extract, PKL electricity,PKL module, Day time, Night time, pH meter*

I. Introduction

In the rainy season, the PKL plant grows quickly than any other season[1-9]. This type of PKL based battery will cost much less than a Solar PV based system popularly known as Solar Home System (SHS) that are available in rural areas[9-20]. Moreover, *Bryophyllum* juice/Extract/Sap based batteries will be able to supply power in the rainy season as well when the output from a SHS will very low [21-40]. Some SHS users may also find it useful to have such a *Bryophyllum* juice based battery which will give them additional power as well as will meet their minimum need in the rainy season when availability of power from SHS is uncertain[41-60]. Our experiments showed that *Bryophyllum* sap can be used as fuel for generating electrical power to energize dc appliances in rural households[61-90]. By increasing the number of electrodes in the cell or by increasing the sizes of the electrodes we can generate enough electricity for operating **computer** to support the need of a rural household[91-140]. This will release the pressure of buying kerosene from the market[141-180]. Moreover, locally available vinegar or lemon juice and other secondary salt can be used to stabilize the voltage output from time to time[181-200]. Cost of a battery to energize two 5W LED lamps and a 25W DC fan will be approximately 72 US Dollars[211]. Such a cheap source of electricity will help to improve the lifestyle of the off grid rural poor people. By our research work we conclude that PKL Juice/Sap present in leaf of Pathor Kuchi (*Bryophyllum*) has electrical properties and can also generate a small amount of electricity as which is illustrated in our work[212].In addition secondary salt with PKL juice we can get large current. We can also conclude that keeping this paper in consideration we can bring a new revaluation in eco-friendly electrical product[213].We can also majorly use PKL sap in the manufacture of eco-friendly batteries. Even in the eco-friendly electrical products. Not only in electrical products but also in manufacture of eco- friendly electronic products for use in electricity supply for the off-grid areas in any country of

the world like Bangladesh[200]. Finally it can be concluded that it is (1) Less expensive (2) Highly efficient (3) Longer life time (4) Environmentally friendly (5) Introduce a sustainable platform to combat the power crisis of this world in future (6) Voltage regulation is about 5.69% (7) Energy Efficiency is close to 65% .

II. Methods and Materials

The methodology has been discussed by the following:

Fig.1(a) pH for water during day time

Fig.1(b) pH for PKL during day time

Fig.1(a) and Fig.1(b)shows an experimental set-up of the pH measurement of the PKL extract during day and night time respectively. The pH of the solution is a great factor for electricity generation. pH defines the acidity measurement of a solution and indicate the rate of H^+ ion dissociation. Previous we discussed about the pH measurement of PKL solution. Electricity generation is high from that solution whose mixture's pH is low. The pH of Pathor Kuchi Leaf juice without water is 4.6 and the pH of Pathor Kuchi malt with water (10% solution) is 4.8 which is ideal for electricity generation. It was a finding that pH varies on picking time. It is a very interesting character of Pathor Kuchi Leaf is that pH of PKL juice whose leaves are picked at night time is higher than PKL juice whose leaves are picked at day time. Consider this experiment we picked Pathor Kuchi Leaf from trees in different two days. Both at two days it was picked Pathor Kuchi Leaf at day time. Then we crushed those leaves with 10% water. After making PKL solution it was made a PKL cell and battery and set up a light load with that battery. In that situation we took some reading of pH measurement of a unit cell using pH meter.

III. Results and Discussion

The data has been collected during the day and night time. The pH was measured by a calibrated pH meter. The collected data was recorded in the following table.

Table 1 : Comparing of pH value of PKL between Day time and Night time leaves of module-1

Time duration (hrs)	pH of Day time picking PKL extract	pH of Night time picking PKLextract
00	4.80	4.62
30	4.92	4.75
60	5.05	4.89
90	5.21	5.02
120	5.45	5.18
150	5.69	5.32
180	5.78	5.49

210	5.99	5.69
240	6.15	5.87
270	6.28	5.41

Table 1 shows the Comparing of pH value of PKL between Day time and Night time leaves of module-1. The module was made by Copper and Zinc plate. PKL extract was used as an electrolyte.

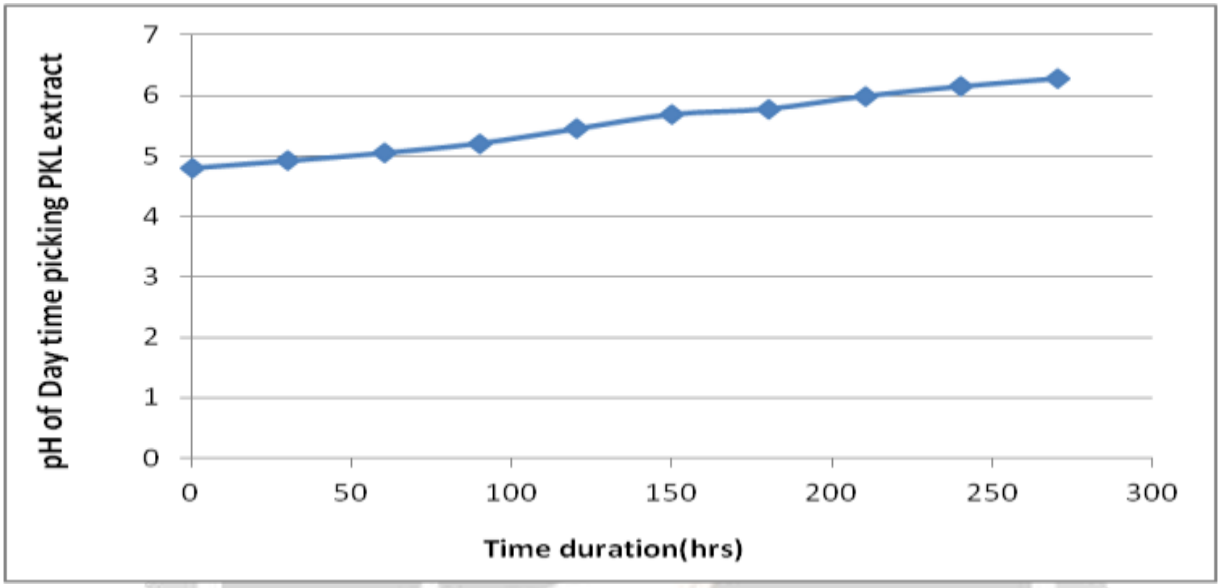

Fig.2 pH of day time picking PKL extract versus time duration(hrs)

Fig.2 shows the pH of day time picking PKL extract versus time duration (hrs). It is shown that pH increases with time duration up to 270 hrs during electricity production at day time.

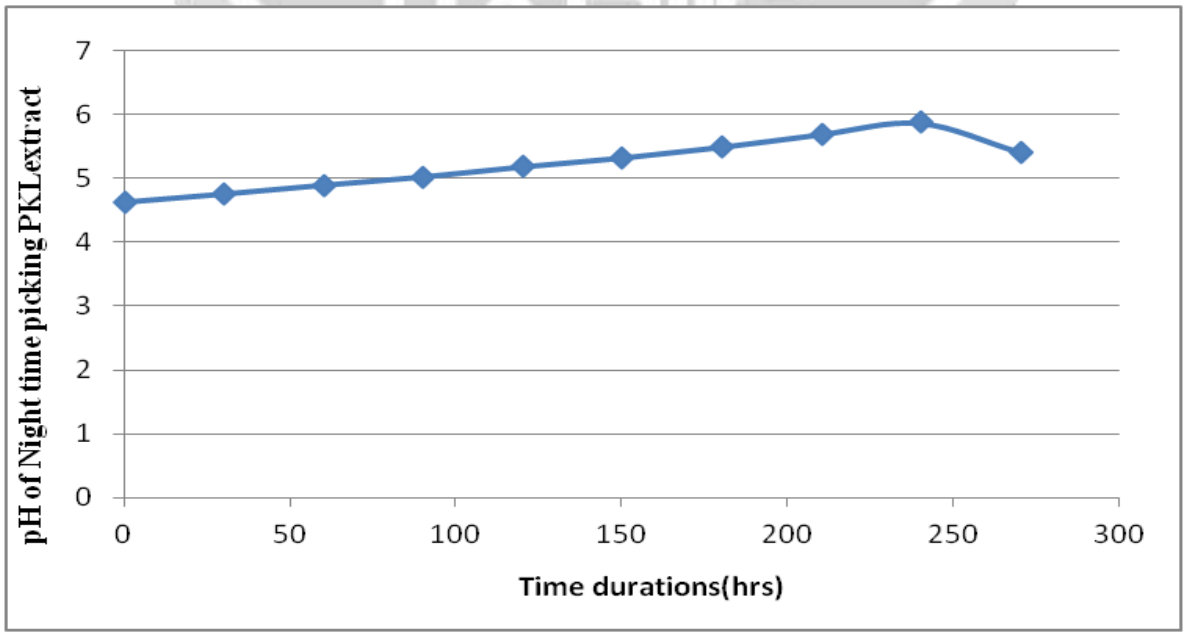

Fig.3 pH of night time picking PKL extract versus time duration(hrs)

Fig.3 shows the pH of night time picking PKL extract versus time duration(hrs). It is shown that pH increases with time duration up to 240 hrs during electricity production at night time. Then after pH decreases up to 270 hrs.

Table 2: Comparing of pH value of PKL between Day time and Night time leaves of First day

Time duration (hrs)	pH of Day time picking PKL **extract**	pH of Night time picking PKL **extract**
00	4.95	4.70
20	5.14	4.91
40	5.30	5.16
60	5.50	5.33
80	5.65	5.51
100	5.79	5.72
120	5.92	5.89
140	6.07	6.07
160	6.22	5.91
180	6.36	6.12

Table 2 shows the Comparing of pH value of PKL between Day time and Night time leaves of module-2. The module was made by Copper and Zinc plate. PKL extract was used as an electrolyte.

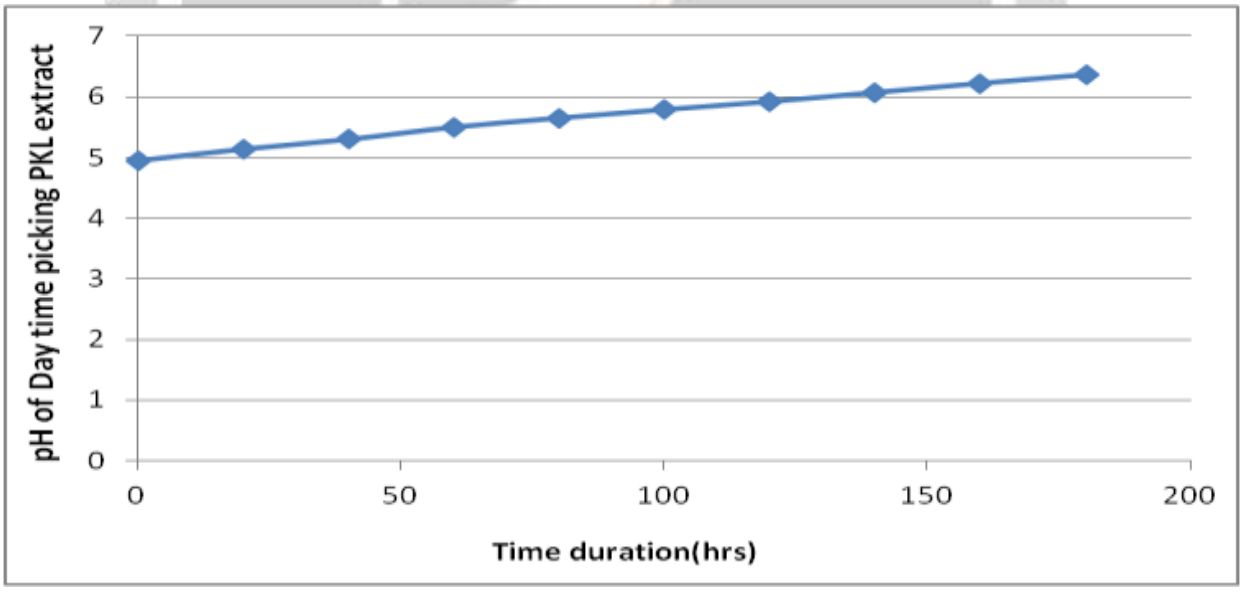

Fig.4 pH of day time picking PKL extract versus time duration(hrs)

Fig.4 shows the pH of day time picking PKL extract versus time duration (hrs). It is shown that pH increases with time duration up to 180 hrs during electricity production at day time.

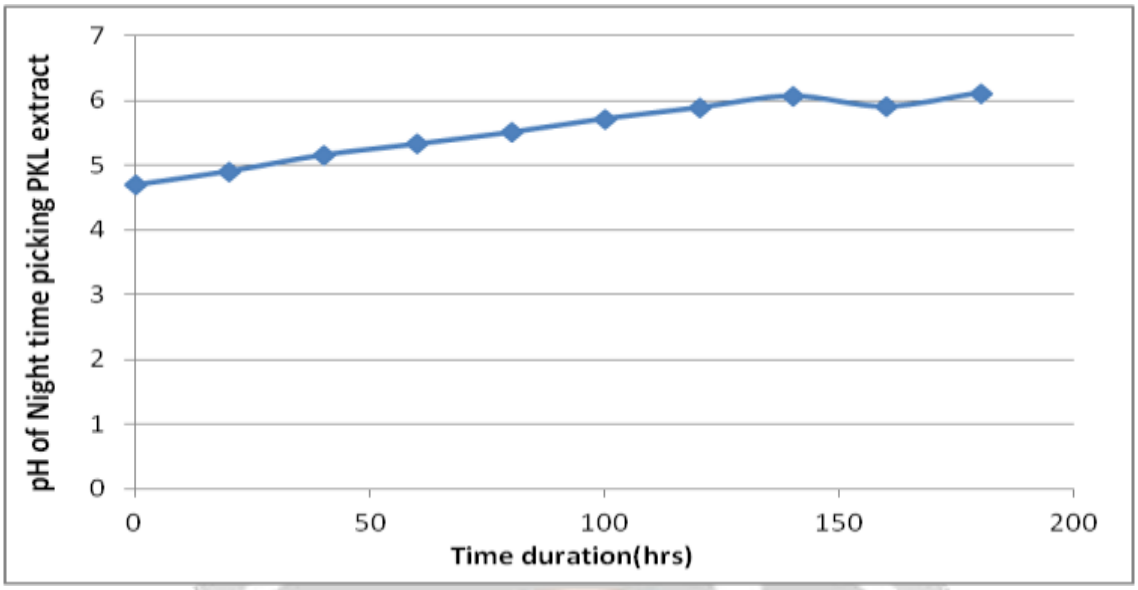

Fig.5 pH of night time picking PKL extract versus time duration(hrs)

Fig.3 shows the pH of night time picking PKL extract versus time duration(hrs). It is shown that pH increases with time duration up to 160 hrs during electricity production at night time. Then after pH decreases up to 175 hrs and then it increases up to 180 hrs.

IV. Conclusions

From the research work, it is shown that the pH increases almost directly during electricity production at day time. It is also shown that the pH increases almost directly during electricity production at night time but after certain period it decreases again. It is also found that the performance of the elctricity production is better for night time than the day time.

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