In [1]:
```
# impoting necessary libraries
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt # visualizing data
%matplotlib inline
import seaborn as sns
```

In [2]:
```
# importing the csv file
df = pd.read_csv(r'C:\Users\hp\Desktop\bio Project\3 Phenolic.csv',encoding= 'unicode_escape')
```

In [3]:
```
# checking for Content loaded in Juypyter notebook
df.head()
```

Out[3]:

	Days	niger cells- CuS Che NPs	niger cells-CuS Bio NPs	niger cells-CuS Che NBs	niger cells- CuS Bio NBs
0	day 1	3.60	2.90	6.47	5.60
1	day 2	2.45	2.00	4.40	3.76
2	day 3	1.80	1.44	3.40	2.71
3	day 4	1.30	1.08	2.52	2.09
4	day 5	1.04	0.84	2.00	1.67

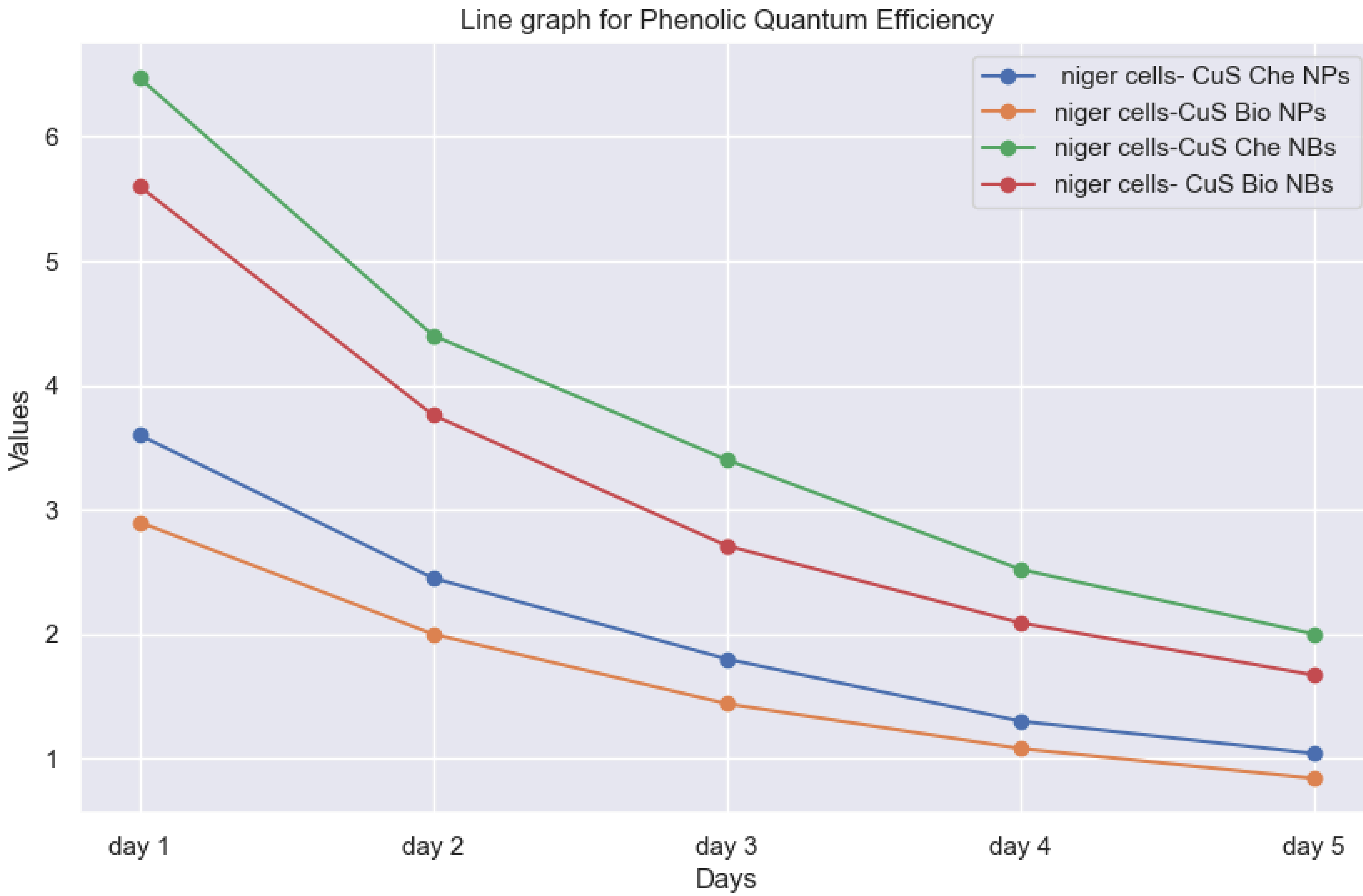
In [4]:
```
# Statistics of the loaded data
df.describe()
```

Out[4]:

	niger cells- CuS Che NPs	niger cells-CuS Bio NPs	niger cells-CuS Che NBs	niger cells- CuS Bio NBs
count	5.000000	5.000000	5.000000	5.000000
mean	2.038000	1.652000	3.758000	3.166000
std	1.025534	0.823116	1.769073	1.571697
min	1.040000	0.840000	2.000000	1.670000
25%	1.300000	1.080000	2.520000	2.090000
50%	1.800000	1.440000	3.400000	2.710000
75%	2.450000	2.000000	4.400000	3.760000
max	3.600000	2.900000	6.470000	5.600000

In [10]:

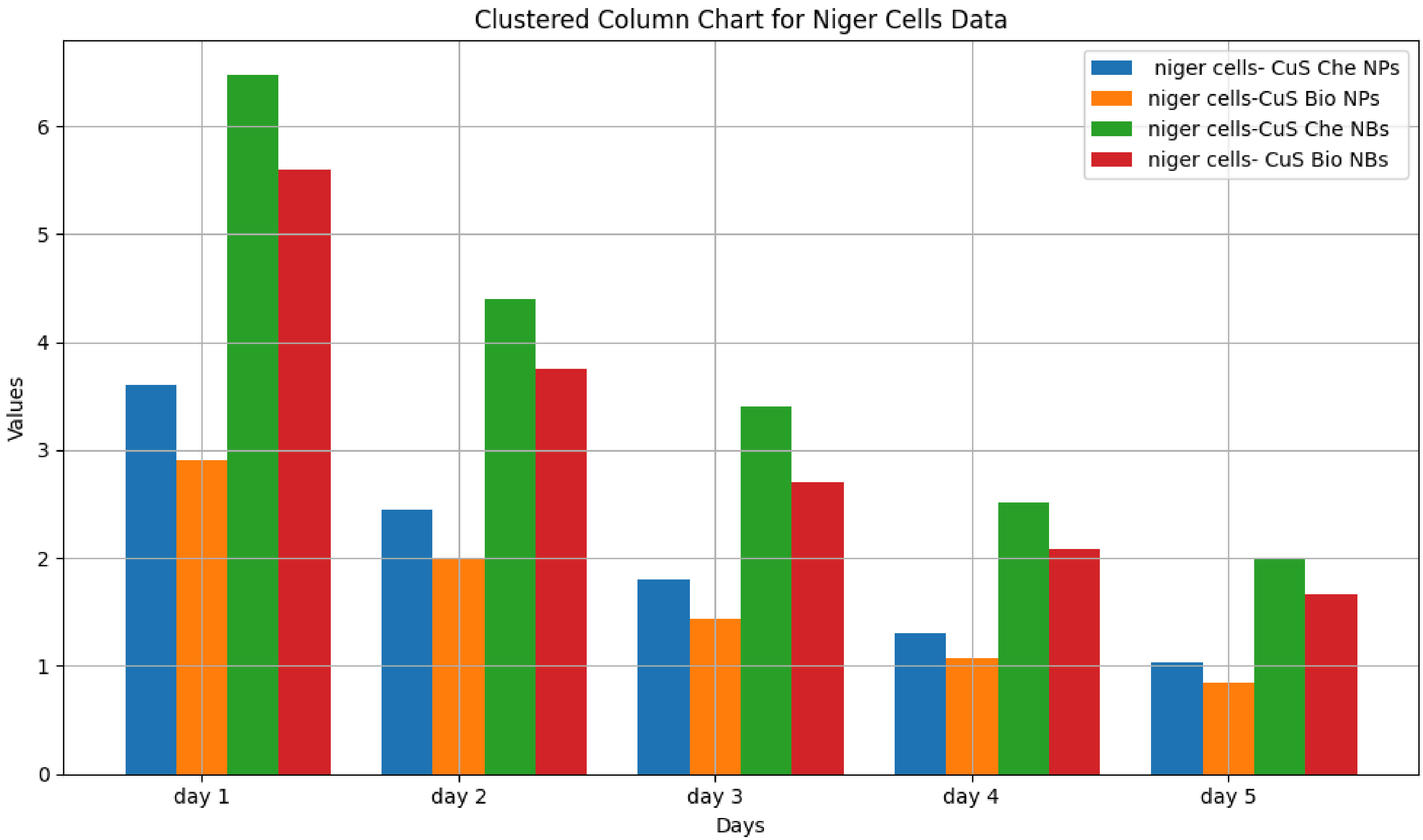
```
# Drawing Linegrpah
plt.figure(figsize=(10, 6))
for column in df.columns[1:]:
    plt.plot(df['Days'], df[column], marker='o', label=column)
    plt.xlabel('Days')
plt.ylabel('Values')
plt.title('Line graph for Phenolic Quantum Efficiency')
plt.legend()
plt.grid(True)
plt.show()
```



In [6]:
```
#Drawing clustered column chart
plt.figure(figsize=(10, 6))
num_columns = len(df.columns[1:])
bar_width = 0.2
index = np.arange(len(df['Days']))

for i, column in enumerate(df.columns[1:], start=1):
    plt.bar(index + i * bar_width, df[column], bar_width, label=column)
```

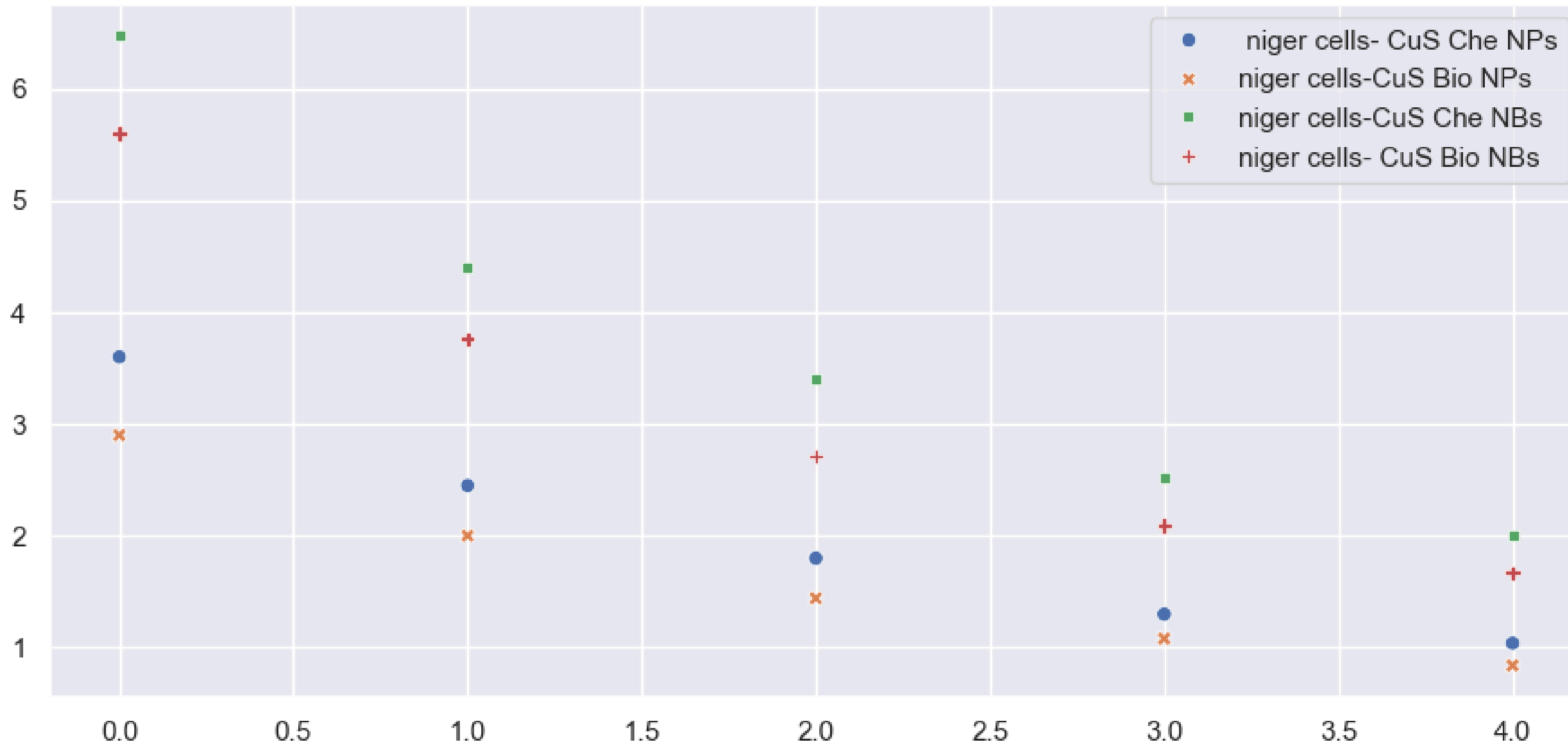
```
    plt.xlabel('Days')
plt.ylabel('Values')
plt.title('Clustered Column Chart for Niger Cells Data')
plt.xticks(index + (num_columns / 2) * bar_width, df['Days'])  # Aligning x-ticks with column groups
plt.legend()
plt.grid(True)
plt.tight_layout()  # Adjust layout to prevent clipping of labels
plt.show()
```



In [8]:
```
# Drawing violingraph
sns.violinplot(data=df)
```

```
sns.set(rc={'figure.figsize':(11,5)})
```

In [9]:
```
#Drawing scatteredgraph
sns.scatterplot(data=df)
sns.set(rc={'figure.figsize':(3,3)})
```


niger cells- CuS Che NPs
niger cells-CuS Bio NPs
niger cells-CuS Che NBs
niger cells- CuS Bio NBs
6
5
4
3
2
1
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0

```
In [ ]:
```