How to Calculate Shannon Wiener Diversity Index

This tutorial explains how to calculate the Shannon Wiener diversity index and Evenness.

Formula:

$H = -SUM [(pi) * ln(pi)]$ $E=H/H_{max}$ Where, SUM = Summation pi= Number of individuals of species i/total number of samples S = Number of species or species richness H_{max} = Maximum diversity possible E= Evenness=H/H_{max}

Example:

The samples of 5 species are 60,10,25,1,4. Calculate the Shannon diversity index and Evenness for these sample values.

Given:

Sample Values (S) = 60,10,25,1,4 number of species (N) = 5

To Find:

shannon diversity index and Evenness

Solution:

Step 1:

First, let us calculate the sum of the given values.

sum	= (60+10+25+1+4)
	= 100

Step 2:

No of sample	pi=sample/sum	ln(pi)	pi*ln(pi)
60	0.60	-0.51	-0.31
10	0.10	-2.30	-0.23
25	0.25	-1.39	-0.35
1	0.01	-4.61	-0.05
4	0.04	-3.22	-0.13
sum=100			SUM = -1.07

H=1.07

Step 3:

H_{max}=ln(N)=ln(5)=1.61 Evenness=H/H_{max}=1.07/1.61=0.66

Result:

Shannon diversity index (H) =1.07 Evenness =0.66