

Exercise 4: Comparison of Two Habitats

1. Calculation of species richness

- Habitat A: $S_A=4$ species.
- Habitat B: $S_B=5$ species.

2. Detailed calculation of the Shannon index (H')

A. Habitat A

The total abundance is $N_A=45$.

Species	n_i	$p_i=n_i/N$	$\ln(p_i)$	$-p_i \ln(p_i)$
<i>Poa annua</i>	25	0.5556	-0.5878	0.3265
<i>Lolium perenne</i>	10	0.2222	-1.5041	0.3342
<i>Taraxacum officinale</i>	5	0.1111	-2.1972	0.2441
<i>Plantago lanceolata</i>	5	0.1111	-2.1972	0.2441
<i>Trifolium repens</i>	0	0	—	0
N (Total effectif)	45			
S (specific richness)	4			
Shanon index H'	1.1489			

Therefore:

$$H'_A=1.1489$$

B. Habitat B

The total abundance is $N_B=55$.

Species	n_i	$p_i=n_i/N$	$\ln(p_i)$	$-p_i \ln(p_i)$
<i>Poa annua</i>	5	0.0909	-2.3979	0.2180
<i>Lolium perenne</i>	15	0.2727	-1.2993	0.3544
<i>Taraxacum officinale</i>	20	0.3636	-1.0116	0.3680
<i>Plantago lanceolata</i>	5	0.0909	-2.3979	0.2180
<i>Trifolium repens</i>	10	0.1818	-1.7047	0.3099
N (Total effectif)	55			
S (specific richness)	5			
Shanon index H'	1.4683			

Therefore:

$$H'_B=1.4683$$

3. Interpretation of the results

Habitat B has greater species diversity and a more balanced distribution of species abundances than Habitat A. The stronger dominance of *Poa annua* in Habitat A contributes to its lower Shannon index.