"Revisiting the Biological Value Index (Sanders, 1960), Contribution to its calculation and visualization"

Juan Carlos Villaseñor-Derbez[1], Arturo Ramírez-Valdez[2]

[1]Bren School of Environmental Science & Management University of California at Santa Barbara, Santa Barbara, California, USA

[2]SCRIPPS Institution of Oceanography, University of California at San Diego, San Diego, California, USA

Corresponding author: Juan Carlos Villaseñor-Derbez[1]

Email address:

jvillasenor@bren.ucsb.edu

Abstract: No more than approx. 500 words (or 3,000 characters).

Introduction

- Indices in ecology
- History of the index
  - When it was proposed
  - How it worked
  - Modifications by Loya Salinas
  - How it works now
- Usage of the index
  - Works that have used it
- Stating the problem
  - Lack of comparison
  - computability

Materials and Methods

- How the index works, step by step (possibly citing Loya-Salinas)
- Flow diagram depfun(ivb)
- Adding the %BVI

$$\%BVI_i = \frac{(100 \times BVI_i)}{\sum_{i=1}^{n} BVI_i} \tag{1}$$

- Compare N and Ni vs rBVI to test its usefulness
- Propose ways to visualize rBVI
- Recreating Loya-Salinas

Spp	S1	S2	S3	S4	S5	S6
Synchelidium spp.	2398	1626	811	1275	1343	7079
Tridentella spp.	2048	1125	528	1990	1098	1274
Nerine cirratulus	37	165	1141	1540	118	53
Nephtys californiensis	544	875	404	170	58	90
Glycera tenuis	265	566	106	646	133	118
Donax gouldii	914	75	42	5	5	15
Orchestoidea benedicti	11	251	133	79	162	245
Archaeomysis spp.	958	90	160	37	522	111
Armadillium spp.	59	155	91	16	208	283
Megalopus spp.	149	266	48	30	0	0
Emerita analoga	101	16	96	27	0	10
Pontharpinia spp.	69	96	11	16	0	0
Euzonus mucronata	0	0	37	341	0	0
Lepidopa californica	5	69	16	0	16	0
Magelona californica	0	5	5	0	42	10
Hanstorina spp.	0	16	5	0	0	0
Glycera dibranchiata	0	0	0	0	5	0
Archaeomysis maculata	0	0	0	5	0	0

- Mention using SIMPER as a comparative
- Propose a graph to visualize data

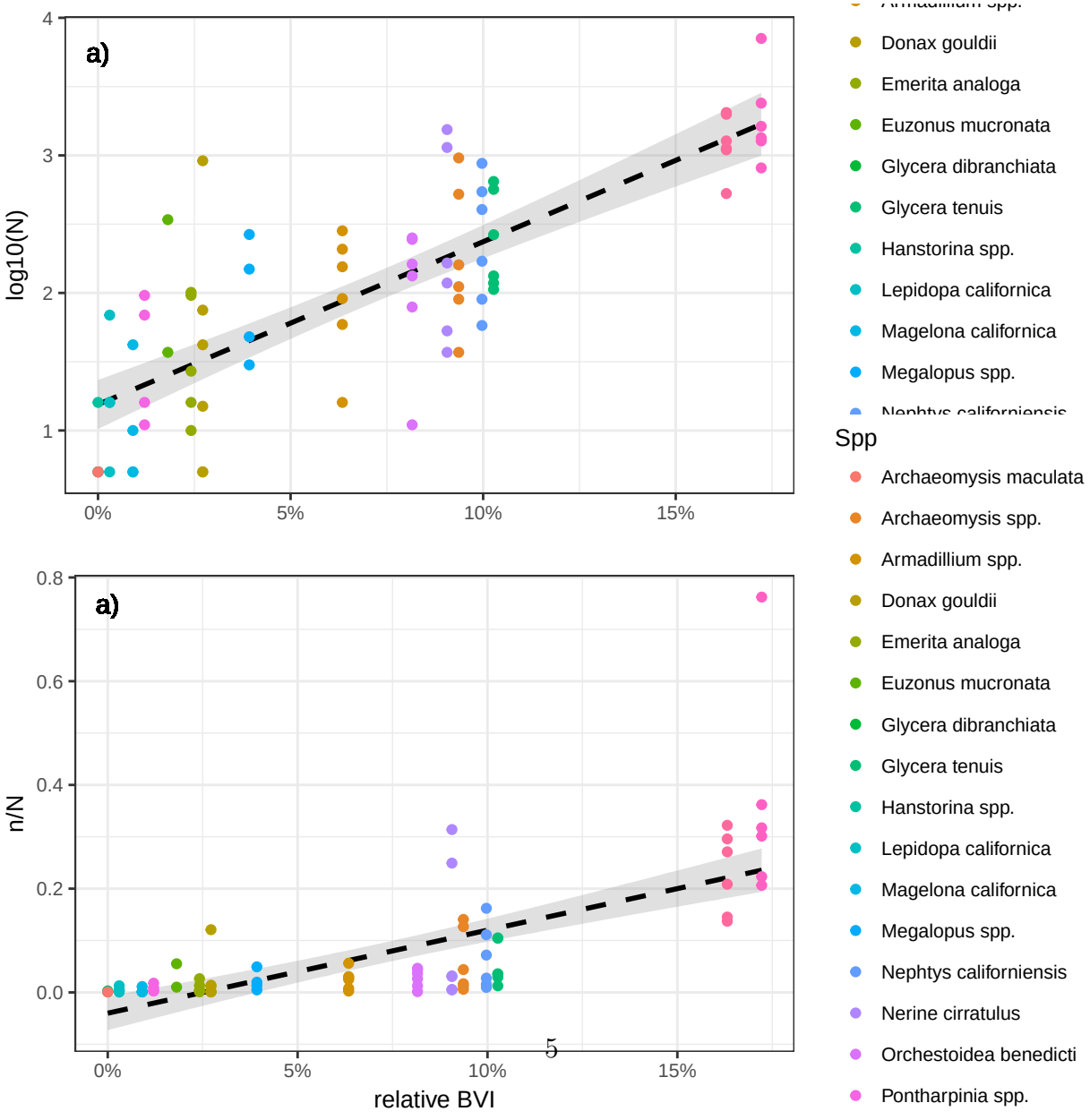
Results

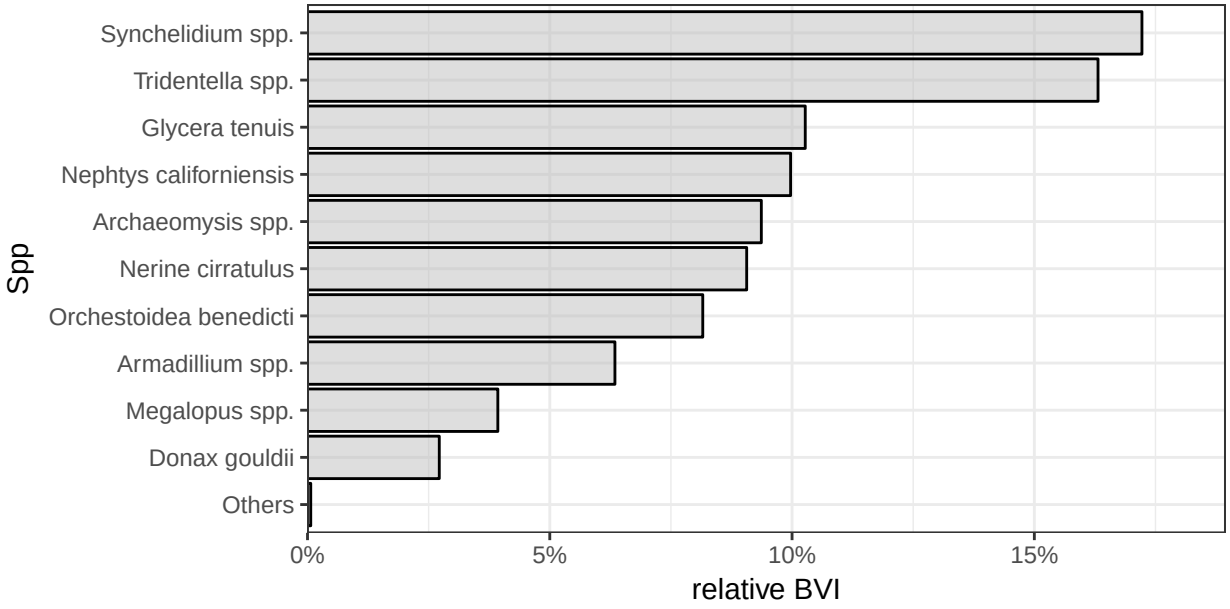
- Results from Loya-Salinas
- Graph
- Comparing %BVI with SIMPER
- Table with abundances, BVI, %BVI and SIMPER

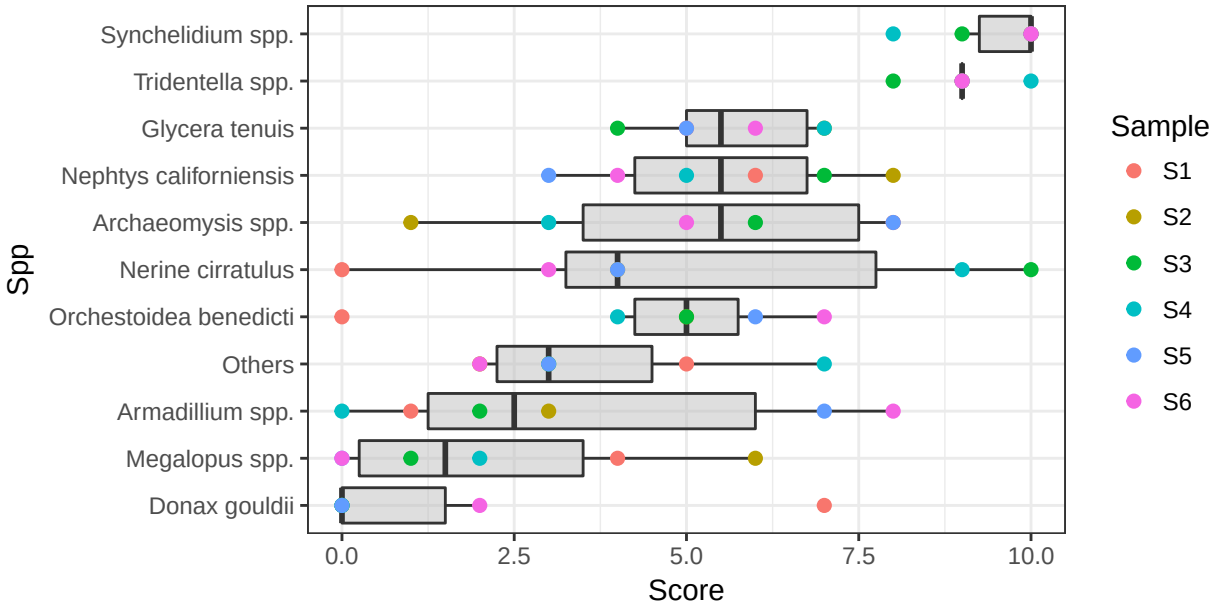
Species	S1	S2	S3	S4	S5	S6	BVI	%BVI
Synchelidium spp.	10	10	9	8	10	10	57	17.22
Tridentella spp.	9	9	8	10	9	9	54	16.31
Glycera tenuis	5	7	4	7	5	6	34	10.27
Nephtys californiensis	6	8	7	5	3	4	33	9.97
Archaeomysis spp.	8	1	6	3	8	5	31	9.37
Nerine cirratulus	0	4	10	9	4	3	30	9.06
Orchestoidea benedicti	0	5	5	4	6	7	27	8.16
Armadillium spp.	1	3	2	0	7	8	21	6.34
Megalopus spp.	4	6	1	2	0	0	13	3.93
Donax gouldii	7	0	0	0	0	2	9	2.72
Others	5	2	3	7	3	2	22	0.07
Total								100.00

Table 1:

	Dependent variable:	
	Abundance	RelAbundance
	(1)	(2)
rBVI	0.118*** (0.010)	0.016*** (0.002)
Constant	1.189*** (0.090)	−0.040** (0.016)
Observations	81	81
R^2	0.636	0.489
Adjusted R^2	0.632	0.482
Residual Std. Error (df = 79)	0.482	0.088
F Statistic (df = 1; 79)	138.264***	75.486***
Note:		*p<0.1; **p<0.05; ***p<0.01




Synchelidium spp.
Tridentella spp.
Glycera tenuis
Nephtys californiensis
Archaeomysis spp.
Nerine cirratulus
Orchestoidea benedicti
Armadillium spp.
Megalopus spp.
Donax gouldii
Others
Spp
0%
5%
10%
15%
relative BVI


Synchelidium spp.
Tridentella spp.
Glycera tenuis
Nephtys californiensis
Archaeomysis spp.
Nerine cirratulus
Orchestoidea benedicti
Others
Armadillium spp.
Megalopus spp.
Donax gouldii
Spp
0.0
2.5
5.0
7.5
10.0
Score
Sample
S1
S2
S3
S4
S5
S6

41

Discussion and Conclusions

References

Figures and Tables