Metodologia Ecológica

Tabelas de Contingência e modelos log-lineares

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TABLE 11.1 Three rows from a dataset measuring factors associated with population status of rare plant species in New England

Species	Invasive species present?	Population declining?	Legal protection?	Light level
Aristolochia	No	No	No	2
Hydrastis	No	Yes	No	0
Liatris	Yes	Yes	No	4
...	...	...	...	...

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TABLE 11.2 Two-way contingency table summarizing the relationship between protection and population status

Population status	Protection status		Row total
	Not protected	Protected	
Declining	$Y_{1,1} = 18$	$Y_{1,2} = 8$	$\sum_{j=1}^{m} Y_{1,j} = 26$
Stable or increasing	$Y_{2,1} = 15$	$Y_{2,2} = 32$	$\sum_{j=1}^{m} Y_{2,j} = 47$
Column total	$\sum_{i=1}^{n} Y_{i,1} = 33$	$\sum_{i=1}^{n} Y_{i,2} = 40$	$\sum_{i=1}^{n}\sum_{j=1}^{m} Y_{i,j} = 73$

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TABLE 11.3 Expected values for data in Table 11.2

Population status	Protection status		Row total
	Not protected	Protected	
Declining	11.75	14.25	26
Stable or increasing	21.25	25.75	47
Column total	33	40	Grand total = 73

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$$G = 2 \times \left(\sum_{i=1}^{n} \sum_{j=1}^{m} \left[Y_{i,j} \ln(Y_{i,j}) \right] - \sum_{i=1}^{n} \left[\left(\sum_{j=1}^{m} Y_j \right) \ln \left(\sum_{j=1}^{m} Y_j \right) \right] - \sum_{j=1}^{m} \left[\left(\sum_{i=1}^{n} Y_i \right) \ln \left(\sum_{i=1}^{n} Y_i \right) \right] + \left[\left(\sum_{i=1}^{n} \sum_{j=1}^{m} Y_{i,j} \right) \ln \left(\sum_{i=1}^{n} \sum_{j=1}^{m} Y_{i,j} \right) \right] \right) \quad (11.8)$$

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TABLE 11.4 Observed (in bold) and expected (in parentheses) values used to test the independence of population status and light level

Population status	Light level					Row total
	0	1	2	3	4	
Declining	5 (3.2)	0 (0.7)	3 (3.6)	12 (12.5)	6 (6.0)	26
Stable or increasing	4 (5.8)	2 (1.3)	7 (6.4)	23 (22.5)	11 (11.0)	47
Column total	9	2	10	35	17	Grand total = 73

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