

[14].

: [4, 6, 17])

v_i — , S_i (S_i, S_j)

$$\frac{p_{ij}}{p_{ji}} = \frac{v_i}{v_j}, \quad (1)$$

p_{ij} — S_i a p_{ji} — S_j (S_i, S_j)
 S_j a $p_{ij} + p_{ji} = 1$. S_i

$$p_{ij} = \frac{v_i}{v_i + v_j} \quad (2)$$

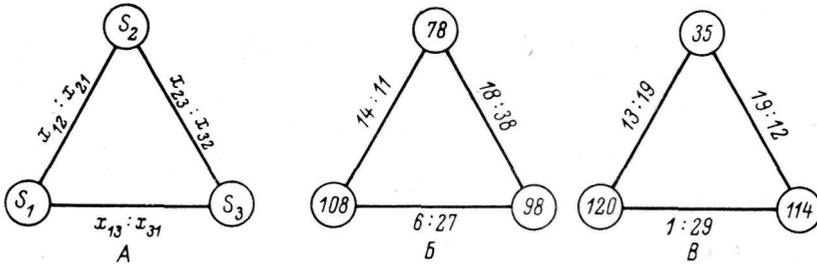
(1) : S_1, S_2, S_3 (S_1, S_2), (S_2, S_3) (S_3, S_1) 1, 2 3.

$$\frac{p_{12}}{p_{21}} \cdot \frac{p_{23}}{p_{32}} \cdot \frac{p_{31}}{p_{13}} = 1. \quad (3)$$

[12]

(3),

p_{ij}



1.

():

S_i (S_i, S_j), n_{ij} $x_{ij} + x_{ji} = n_{ij}$ (1).

(1).

(3)

[12]

$$\ln \frac{x_{ij}}{x_{ji}}, \quad x_{ij} > 0$$

$$\ln \frac{p_{ij}}{p_{ji}}$$

$$\frac{p_{ij}(1-p_{ij})}{n_{ij}} \cdot \frac{1}{p_{ij}^2(1-p_{ij})^2} = \frac{1}{n_{ij}p_{ij}p_{ji}}$$

(3),

$$\ln \frac{p_{12}}{p_{21}} + \ln \frac{p_{23}}{p_{32}} + \ln \frac{p_{31}}{p_{13}} = 0,$$

(3)

$$\ln \frac{x_{12}}{x_{21}} + \ln \frac{x_{23}}{x_{32}} + \ln \frac{x_{31}}{x_{13}}$$

$$\sigma^2 = \frac{1}{n_{12}p_{12}p_{21}} + \frac{1}{n_{23}p_{23}p_{32}} + \frac{1}{n_{31}p_{31}p_{13}}.$$

p_{ij}

$$\bar{p}_{i,j} = \frac{x_{ij}}{n_{ij}},$$

$$A = \frac{\ln \frac{x_{12}}{x_{21}} + \ln \frac{x_{23}}{x_{32}} + \ln \frac{x_{31}}{x_{13}}}{\sqrt{\frac{n_{12}}{x_{12}x_{21}} + \frac{n_{23}}{x_{23}x_{32}} + \frac{n_{31}}{x_{31}x_{13}}}}$$

1.

[1].

[12],

3.29

(

0.1% -

;) | | 1.96,

2.57

(3)

| | 0

20

[12]

n_{ij}

20—30,
5.

x_{ij}

(2).

(3)

x_{ij}

0.

n_{ij}

[20]

(3).

(3),

[20, 21].

1,

$$= x_{12} + x_{13},$$

$$b = x_{23} + x_{13},$$

$$c = x_{13},$$

$$d = \min \{a, b, n_{13}\}.$$

(3),

b

$$P \{c = k\} = \frac{C_{n_{12}}^{a-k} \cdot C_{n_{23}}^{b-k} \cdot C_{n_{13}}^k}{\sum_{l=0}^d C_{n_{12}}^{a-l} \cdot C_{n_{23}}^{b-l} \cdot C_{n_{13}}^l}.$$

(4)

$$(3). \quad \dots \quad \{c=k\}$$

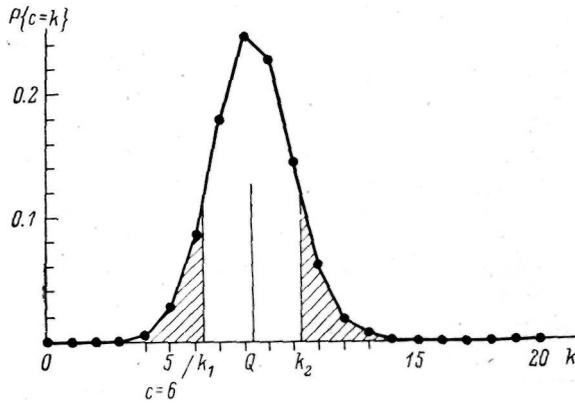
$$(4): \quad Q = \sum_{k=0}^d kP\{c=k\}.$$

$Q -$

$$k_2 > k_1,$$

$$\left. \begin{aligned} \sum_{k < k_1} P\{c=k\} + \sum_{k > k_2} P\{c=k\} = a \\ \sum_{k < k_1} kP\{c=k\} + \sum_{k > k_2} kP\{c=k\} = aQ. \end{aligned} \right\} \quad (5)$$

$$b, \quad n_{23} \quad 13 \quad c < k_1 \quad > k_1 \quad (2),$$



$$. 2. \quad \{c=k\} \quad . 1.$$

$$c \quad (5)$$

$$(3)$$

$$(5)$$

[21].

$$(3).$$

(), $\alpha_1 \ll 1$ $\alpha_1 < 1$.

$$\alpha_e = \sum_{i=m}^M C_M^i \alpha_1^i (1 - \alpha_1)^{M-i}.$$

$$\alpha_e = \sum_{i=1}^M C_M^i \alpha_1^i (1 - \alpha_1)^{M-i} = 1 - (1 - \alpha_1)^M \approx M\alpha_1.$$

(4).

[9, 15],

$v_i, v_j,$

$$\bar{x}_{ij} = \frac{n_j v_i}{v_i + v_j} \quad \bar{x}_{ji} = \frac{n_i v_j}{v_i + v_j}.$$

(, ,

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(, ,

$$\sum_{i,j} \frac{(x_{ij} - \bar{x}_{ij})^2}{\bar{x}_{ij}} \quad (6)$$

$$s-t+1. \quad (6)$$

$$[1]. \quad (6)$$

$$0, \quad n_{ij},$$

$$[22]. \quad [16],$$

$$\sum_j x_{ij}$$

[10, 15].

$$\prod_{i>j} p_{ij}^{x_{ij}} p_{ji}^{x_{ji}} = \prod_{i>j} \left(\frac{v_i}{v_i + v_j} \right)^{x_{ij}} \left(\frac{v_j}{v_i + v_j} \right)^{x_{ji}} = \frac{\prod_{i,j} v^{x_{ij}}}{\prod_{i>j} (v_i + v_j)^{n_{ij}}}. \quad (7)$$

$$\frac{\sum_{j=1}^t x_{ij}}{v_i} - \sum_{j=1}^t \frac{n_{ij}}{v_i + v_j} = 0, \quad (8)$$

$i=1, \dots, t.$

$$\left(\sum_{i=1}^t v_i = 1 \right)$$

$$v_i^{(r+1)} = \frac{\sum_{j=1}^t x_{ij} v_j^{(r)}}{\sum_{j=1}^t \frac{n_{ij} v_j^{(r)}}{v_i^{(r)} + v_j^{(r)}}}$$

[16],

[2]

[7]

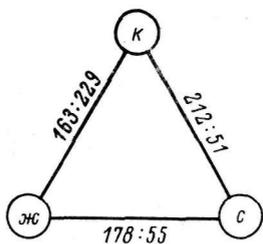
1970—1976

(Rana temporaria)

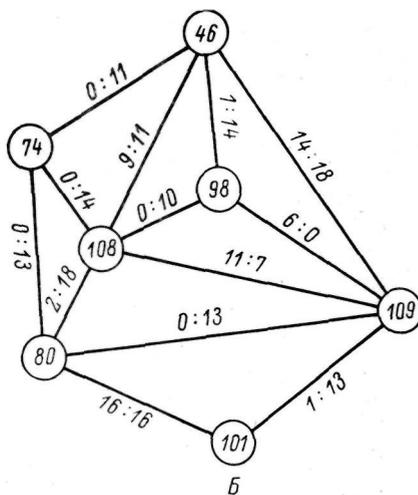
(Bufo bufo)

(Bufo viridis).

[5].



A



B

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(218),

1976

Bufo viridis,

. 3.

(1—4).

1-

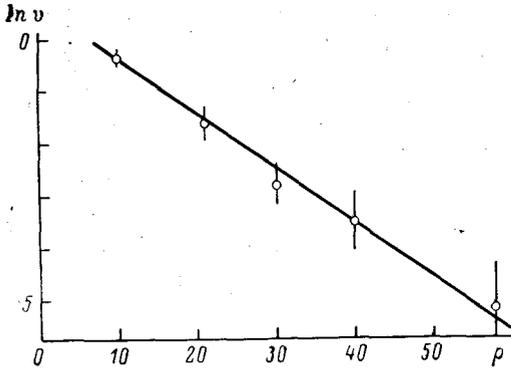
2-

(4)

							1-	2-	3-	4-
I.			3	888	1	888	0.71			0.72
II.	(-		14	727	36	55	—	0.086	0.96	0.09
III.) (- -		10	431	7	93	—	0.00051	0.0036	0.02
IV.) (-		8	483	20	236	0.07	0.11	0.9	0.03
V.) (-		7	218	8	51		0.46		0.0001

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 (II) - (III),
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$$\ln i = a_i + b \tag{9}$$

(. 4)

(9)

(7),

$$\sum_{i>j} n_{ij} \left(\frac{\rho_i - \rho_j}{2} \right) \text{th} \left(a \frac{\rho_i - \rho_j}{2} \right) = \sum_{i,j} \rho_i \left(\frac{n_{ij}}{2} - x_{ij} \right).$$

x_{ij} ,

x^*_{ij} ,

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3. —, 1975, . 20, . 725—730.
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