Spatial distribution pattern and interspecific association of *Populous euphratica* and *Tamarix ramosissima* seedlings populations in Desert Inland Riparian

Abstract: In this paper , the methods such as V/m ratio t-test, negative binomial parameter, clump index, mean crowding intensity，index of patchiness，dispersion coefficient and two-term local variance(TTLV) have been used to analyse spatial distribution pattern and interspecific association of *Populous euphratica* and *Tamarix ramosissima* seedlings populations in the middle and lower reaches of the Tarim River. The results showed that the spatial distribution pattern of two populations all presented significantly aggregative at block size 16 m². Based on 2 x 2 contingency table, the interspecific associations of two species were examined by means of x^2-test , together with the association coefficient(*AC*) and percentage co-occurrence(*PC*). The results indicated that two species showed significantly positive association. the above results reflected that the two populations are stable distribution pattern, and the two species coexist and hold the common ecological niche .

Key word: *Populous euphratica*; *Tamarix ramosissima*; spatial distribution pattern; interspecific association

1. Methods

The study was carried out in the middle and lower reaches of the Tarim River, in XinJiang, China. The method with contiguous grid quadrate 2x2m was used in 16x48m plots.

Results

spatial distribution pattern

Analysis of spatial distribution pattern showed po*pulous euphratica* and *tamarix ramosissima* seedlings populations all presented significan- aggregative(Tab.1 and 2). According to negative binomial parameter K and index of patchiness m*/m, aggregating intensity of *tamarix ramo-ssima* seedlings were higher than populous euphratica. The result showed tamarix ramosissima were apt to seize more spaces. According to ump index It, and mean crowding intensity m*, numbers and concentration of populous euphratica populations in per unit quadrat were high- tamarix ramosissima. The result showed populous euphratica population were inclined to fill in ecological spaces.

Tab.1 Cluster-intensity coefficient of spatial pattern of *Populous Euphratica* populations in different measurement scales

Quadrat size(m)	v	m	v/m	mean	type	k	m^*	m^*/m	C	Ie
4	202.240	11.55	20.13	136.91	clump	0.60	30.67	2.67	20.13	19.13
8	653.246	23.09	39.55	196.78*	clump	0.51	51.05	2.24	39.55	38.55
16	2470.07	46.19	57.45	254.40*	clump	0.88	93.67	2.14	57.45	57.45
32	8882.68	92.38	96.27	322.07*	clump	0.97	187.64	2.03	96.27	95.27
64	14281.46	184.76	77.49	179.37**	clump	2.42	261.24	1.41	77.49	76.49
128	41204.30	369.50	111.51	174.74**	clump	3.34	480.01	1.30	111.51	110.51
256	66571.00	739.00	90.03	89.01*	clump	8.30	833.03	1.12	90.03	89.03

*F<0.05，**F<0.01

Tab. 2 Cluster-intensity coefficient of spatial pattern of *Tamarix ramosissima* populations in different measurement scales

Quadrat size(m)	v	m	v/m	mean	type	k	m^*	m^*/m	C	Ie
4	14697	8.68	1693	159.30**	clump	0.54	24.68	2.84	16.93	15.93
8	44637	17.37	25.68	171.25**	clump	0.70	42.12	2.44	25.68	24.68
16	157842	34.74	45.70	216.67**	clump	0.77	79.24	2.29	45.70	44.70
32	578965	69.48	83.81	289.81**	clump	0.83	153.09	2.20	83.81	82.81
64	2088170	138.97	151.37	351.64**	clump	0.92	288.51	2.08	151.37	150.37
128	7558467	278.93	274.50	432.48**	clump	1.01	549.84	1.99	274.50	273.50
256	10651713	557.87	180.56	189.56**	clump	2.92	742.23	1.34	180.56	189.56

*F<0.05，**F<0.01

2.2 Interspecific association

We tested interspecific association of *populous euphratica* and *tamarix ramosissima* seedlings populations with X^2 statistic of on 2 x 2 contingency table, when the size of quadrat was 4m², X^2 statistic =12.28 > 6.635. Thus two species appeared significantly association. Association coefficient(*AC*) = 0.17, the result showed two species appeared positive association. Percentage co-occurrence(*PC*) = 0.76, the result showed positive association of two species appeared very strong.

2.3 aggregative scale of pattern

We divided populous euphratica and tamarix ramosissima seedlings populations into 7 blocks(1、2、4、8、16、32、64), and analysed aggregative scale of pattern of two populations with two-term local variance,TTLV. According to Fig.1, populous euphratica and tamarix ramosissima populations all appeared peak value at block 16 m2, the result showed two populations were small aggregative scale.

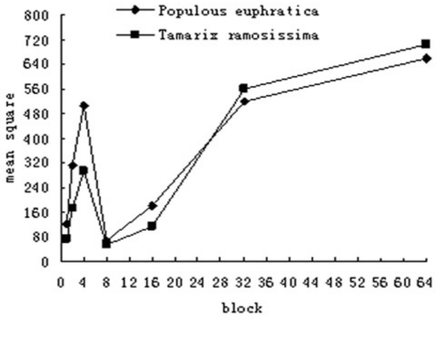

Fig.1 Distribution Pattern Analysis of Populous euphratica and Tamarix ramosissima

3 Conclusion

Populous euphratica and *tamarix ramosissima* seedlings populations all presented significantly aggregative. Two species appeared significantly positive association. Association coefficient(*AC*) = 0.17, Percentage co-occurrence(*PC*) = 0.76, the results showed positive association of two species appeared very strong. Two populations were small aggregative scale at block 16 m². the above results reflected that the two populations are stable distribution pattern, and the two species coexist and hold the common ecological niche .

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