崩岗修复中不同人工林林下入侵植物和本土植物的生态位特征和种间关系

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摘　要：为筛选出崩岗修复早期抵御林下入侵植物的林分类型，构建和谐稳定的林下植物群落，以2013 年为修复广东三岭山国家森林公园崩岗区而种植的湿地松（*Pinus elliottii*）、尾叶桉（*Eucalyptus urophylla*）大叶相思（*Acacia auriculaeformis*）和樟树（*Cinnamomum camphora*）4 种林分为研究对象，于2019 年在 4 种林分内分别设置 10 个 20 m×20 m 的连续样方并进行林下植物调查，以多样性指数、生态位宽度、生态位重叠度、生态响应指数和种间联结指数来探究抵抗入侵物种能力最佳的树种，并进行林下植物群落配置。结果表明：（1）在 4 种林分中，尾叶桉林的林下入侵物种数目最少，有 4 种，且入侵植物多样性指数和生态位宽度均最小，同时与本土植物的生态位重叠度也最小，说明尾叶桉抵御林下外来入侵植物的能力最好。（2）林下植物群落未来发展趋势最佳的是湿地松林，其次是尾叶桉林，且除大叶相思林外，其他 3 种林分正发展的平均速率大于负发展，林下植物群落处于正向发展。（3）4 种林分的林下植物的种间联结较小（OI≤0.5），且多为负联结，群落均处于不稳定阶段。因此在崩岗修复早期阶段，可以种植尾叶桉来迅速成林，抵抗入侵植物，并选取正联结的植物进行林下植物群落的配置。

关键词：崩岗；林下植物；多样性；生态位特征；种间联结；植物配置

Effects of understory invasive plants and native plants on community stability in Benggang ecological restoration of different artificial forests

Abstract: To explore the community construction scheme of Benggang ecological restoration based on nature, four stands (*Pinus elliottii*, *Eucalyptus urophylla*, *Acacia auriculaeformis*, and *Cinnamomum camphora*）were studied for early restoration in Benggang area of Guangdong Sanlinshan National Forest Park, located in the southernmost tip of mainland China. In terms of understory invasive and native species, we conducted the quadrat survey, analyze the community stability of different stands through species diversity, niche width, niche overlap, ecological response and species association index, and optimize understory plant allocation. The results were showed as follow: (1) Among the four stands, the number of species, diversity index and niche width of understory invasive in *Eucalyptus urophylla* stand was the lowest, and the niche overlap between understory invasive plants and native plants was also the lowest. (2) The future development trend of the understory plant community was the best in *Pinus elliottii* stand, followed by *Eucalyptus urophylla* stand. The average rate of the positive development of *Pinus elliottii*, *Eucalyptus urophylla*, and *Cinnamomum camphora*, the three stands was higher than the negative development, except for *Acacia auriculaeformis* stand. (3) The interspecific associations of the understory plants of the four stands were small (OI≤0.5), and most of them were negative associations, and the communities were in an unstable stage. (4) The pattern of community allocation can be optimized as: *Eucalyptus urophylla-Dicranopteris Dichotoma-Rottboellia Linn-Miscanthus Sinensis*, *Pinus elliottii- Miscanthus Sinensis-Imperata Cylindrica-Blechnum Orientale*, *Acacia auriculaeformis-Miscanthus Sinensis-Blechnum Orientale-Rhodomyrtus Tomentosa*,

Cinnamomum camphora-Rhodomyrtus Tomentosa-Rottboellia Linn-Mallotus Paniculatus. Therefore, when planting fast-growing trees to rapidly afforest for early restoration in Benggang area, we can give priority to stands with abundant understory native plants and few understory invasive plants (such as *Eucalyptus urophylla* stand). Positive associated understory native plants can be select for understory plant community allocation, so as to effectively resist understory invasive plants and form stable progressive understory plant community.

Key word: Benggang; Understory plants; Diversity; Niche characteristics; Interspecific linkages; Plant allocation