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广西西端海岸四种红树植物天然种群生境高程

Tide elevations for four mangrove species along western coast of Guangxi, China

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中文摘要:

在广西防城港市东湾渔洲坪、石角、交东3个样地平行海面方向共设置18条剖面对4种红树植物白骨壤(*Avicennia marina*)、桐花树(*Aegiceras corniculatum*)、秋茄(*Kandelia obovata*)、木榄(*Bruguiera gymnorhiza*)在沿海滩涂生长带高程测量和群落调查。调查结果表明:由于人类活动造成东湾渔洲坪和交东两个样地的坡度变化较大,分别从-0.37变化为-0.05和-0.72变化为-0.10,而地处北仑河口保护区内的石角样地受到保护,没有人为因素的影响,坡度从-0.23变化为-0.10变化不大。石角和交东两个样地中的桐花树集中出现在高程15至40 cm和33至36 cm范围内;秋茄集中出现在高程43至60 cm和37至51 cm范围内;木榄集中出现在高程94至106 cm和111至119 cm范围内。所有样地中的白骨壤在高程60至80 cm范围内,树高最高达到220 cm,且分布密集;桐花树在高程20至40 cm范围内,树高最高达到200 cm,且分布密集;秋茄在高程40至80 cm范围内,树高最高达到200 cm,且分布密集;木榄在高程60至100 cm范围内,且分布密集,树高最高达280 cm。通过对各样地剖面上红树植物种类出现频度的分析和林木高度的测量,4种红树植物天然林临界滩涂高程分别为:桐花树为-7 cm;秋茄为+33 cm;白骨壤为+23和+26 cm;木榄为+44 cm。对应的浸淹时间分别为8.5、7.0、7.0、6.0h。在石角和交东分别有30.0%和56.7%的桐花树分布于平均海平面以下,秋茄也能分布在此高程下,平均株高也达1.75 m。根据现场实际调查结果,桐花树、秋茄可以大量生存在平均海平面以下的滩涂上。

English Summary:

Mangrove ecosystems play irreplaceable and important roles for the stabilization and equilibrium of coastal estuary. Mangroves are the unique intertidal plant formations growing in sheltered tropical and subtropical coastal areas. Due to increasing population and economic development, they had been severely damaged in the last several decades, facing degradation and loss. In recent years, many measures were undertaken to rehabilitate mangroves in different countries. However, followed by anthropologic disturbance and natural disasters, lower survival rate of afforestation, and careless management to slow enhancement of mangrove area. Then lower survival rate was the prmiary threshold to mangrove restoration.

Critical tidal elevation for mangrove species was focused in this paper, because it is one of the key factors determining the chance of successful mangrove afforestation in the Beibu Gulf and even the whole coast of China. Based on the field surveys on the growth and the distribution of natural trees, the critical tidal elevations for the major mangrove species along Beibu Gulf coast were proposed. The results would be helpful to improve the rationalized mangrove afforestation along Beibu Gulf coast.

Tidal elevation is one of the most important factors affecting the survival of mangrove seedlings. The present study aimed at finding critical tidal elevation for the selection of tidal flat for mangrove afforestation. In this paper, tidal elevation and mangrove community survey were conducted at three sites: Yuzhouping, Shijiao and Jiaodong in Fangchenggang, Guangxi. Eighteen transects parallel to the coast were set and the occurrence, growth condition and tidal elevation of 4 mangrove species *Avicennia marina, Aegiceras corniculatum, Kandelia obovata* and *Bruguiera gymnorhiza* were surveyed. The changes of slope in three natural forests were: from -0.37 to -0.05 in Yuzhouping, from -0.23 to -0.10 in Shijiao, and from -0.72 to -0.10 in Jiaodong, respectively. At Shijiao and Jiaodong,*Aegiceras corniculatum* appeared majorly in the tidal flat with an elevation from 15 to 40 cm and 33 to 36 cm, *Kandelia obovata* from 43 to 60 cm and 37 to 51 cm, *Bruguiera gymnorhiza* from 94 to 107 cm and 111 to 119 cm, respectively. The corresponding tidal elevations for the maximum heights of *Av. Marina* (220 cm), *Ae. Corniculatum* (200 cm), *K. obovata* (200 cm) and *B. gymnorhiza* (280 cm) were +60 cm to +80 cm, from +20 cm to +40 cm, from +40 cm to +80 cm and from +60 cm to +100 cm, respectively. According to the occurrence frequency and height distribution along the transects, the critical tidal elevations of the 4 mangrove species in Fangchenggang were -7 cm (*Ae. Corniculatum*), +33 cm (*K. obovata*), +23~26 cm (*Av. marina*) and +44 cm (*B. gymnorrhiza*), respectively. The corresponding flooding times in one tidal cycle for each species were 8.5h, 7.0h, 7.0h, and 6.0h, respectively. At Shijiao and Jiaodong, 30.0% and 56.7% of *Ae. corniculatum* trees with an average height over 2m occurred on the tidal flat below the local mean sea level (MSL), respectively. *These Ae. Corniculatum* were accompanied by some *K. obovata* trees (average height 1.75 m). The results showed that *Ae. Corniculatum* and *K. obovata* can grow in the tidal flat below the MSL.

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