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盘锦湿地芦苇叶片气孔导度的模拟

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摘要 基于2005年5～9月盘锦湿地芦苇叶片气体交换观测数据,
针对芦苇叶片气孔导度与光合速率以及光合速率与光合有效辐射之间的关系进行分析。结果表明:芦苇叶片气孔导度与光合速率的关系可应用Ball-Berry模型描述,光合速率与光合有效辐射的关系可应用非直角双曲线光合模型描述,联合Ball-Berry模型与非直角双曲线光合模型可通过环境变量求解叶片气孔导度。模型考虑了气孔导度与光合之间的相互作用。利用实验数据对气孔导度模型验证表明,叶片气孔导度模拟值和观测值回归方程的斜率为0.95,方程决定系数R=0.82(P<0.05)。

关键词 湿地 芦苇 气孔导度 模型模拟

分类号

Simulating leaf stomatal conductance of reed(Phragmites communis) plant in Panjin wetland

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Abstract The stomata are a key channel of gas exchange between plants and their environment.Stomatal conductance is an important parameter for estimating the fluxes between vegetation and atmosphere.Leaf stomatal conductance of reed plant in Panjin wetland were simulated,based on the long term leaf photosynthetically ecophysiological observations of reed plant.It showed that there was a linear relationship between stomatal conductance and photosynthesis rate,and a non-rectangular hyperbolic response of photosynthesis to photosynthetically active radiation(PAR).Thus,a leaf stomatal conductance model was constructed by coupling a Ball-Berry model and a non-rectangular hyperbolic photosynthesis model.The model could simulate the stomatal conductance directly from environmental variables,whilst taking account of the interaction between stomata movement and photosynthesis.The simulated values of stomatal conductance were correspondence with the observed data very well(R=0.82,P<0.05).

Key words Wetland Reed Stomatal conductance Model simulation

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通讯作者