

Potential planting regions of *Pterocarpus santalinus* under current and future climate in China based on MaxEnt model

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Abstract

Abstract: This study explores the habitat distribution of *Pterocarpus santalinus*, a valuable rosewood species, across China, focusing on its response to current and future climate changes. Utilizing the MaxEnt model, we assess its suitable habitat under present conditions and future climate scenarios (SSPs126, SSPs245, and SSPs585). Our findings reveal that the current suitable habitat, spanning approximately 409,600 km², is primarily located in the central and southern parts of Guangdong, Guangxi, Fujian, Yunnan, as well as in the Hainan provinces, along with the coastal regions of Taiwan, and the Sichuan-Chongqing border. The habitat's distribution is significantly influenced by climatic factors such as temperature seasonality (bio4), mean temperature of the wettest quarter (bio8), annual mean temperature (bio1), and annual precipitation (bio12), while terrain and soil factors play a lesser role. Under future climate scenarios, the suitable habitat for *P. santalinus* is projected to expand, with a northeastward shift in its distribution center. This research not only sheds light on the geoecological characteristics and geographical distribution of *P. santalinus* in China but also offers a scientific basis for planning its cultivation areas and enhancing cultivation efficiency under changing climate conditions.

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