

Prediction of potential distribution area of *Glycyrrhiza iflata* based on Maxent model

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Abstract

As one of the primary medicinal species of *Glycyrrhiza* under state key protection, *Glycyrrhiza iflata* has the characteristics of light-loving, drought-tolerant, heat-resistant, and salt-tolerant, and belongs to the dominant species in Xinjiang extreme desert ecosystem. Based on 130 effective distribution records and 8 environmental factors in China, the Maxent model was used to construct the potential geographical distribution pattern of *Glycyrrhiza iflata* in the last glacial maximum, middle Holocene, modern and future (2050). Essence Results show that: (1) The key climate restrictions that affect the geographical distribution of *Glycyrrhiza iflata* is the average annual precipitation. (2) The modern area of *Glycyrrhiza iflata* is $18.3 \times 105\text{km}^2$. (3) Under the low emission scenario from the last interglacial maximum to 2050, the potential habitable area is $18.1 \times 105\text{km}^2$, and the reduced area is $4.2 \times 105\text{km}^2$, with a reduction rate of 19.0%. The highly suitable area was $2.5 \times 105\text{km}^2$, and the reduced area was $2.8 \times 105\text{km}^2$, with a reduction rate of 52.6%. (4) From the last glaciation maximum to the middle Holocene, the geographical distribution center shifted to the southwest margin of the Kumtag Desert, Xinjiang. Since then, the geographical distribution center of *Glycyrrhiza iflata* will continue to migrate to the southwest, but it's going to stabilize in the future (2050). These results provided theoretical basis for the protection, utilization, origin, and evolution of *Glycyrrhiza iflata*.

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