

Predicting the impact of climate change on the potential distribution of South American tomato moth, *Phthorimaea absoluta* (Meyrick) (Lepidoptera: Gelechiidae) using CLIMEX

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The South American tomato moth, *Phthorimaea absoluta* (Lepidoptera: Gelechiidae), is native to South America, but is a major invasive and quarantine pest and spread to other parts of the world due to global trade in agricultural products. To evaluate the potential distribution of *P. absoluta* in the world, we used CLIMEX ver. 4.0, a bioclimatic software for modelling the pest distribution of *P. absoluta* under present and future climate change scenarios. Here the results showed that Southeast and Southwest of North America, Central and South Americas, East, Central, Southern and some Western Africa, North Europe, South and Southeast Asia and a major portion of Australia were highly suitable areas for *P. absoluta* in current and future climates. Regions with high latitude areas will be flatter and more ideal for the *P. absoluta* in future due to a significant rise in temperatures (RCP 8.5 scenario). The predictions by our model suggest that the total geographic distribution range of *P. absoluta* in the world is to increase slightly with future climate changes.

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existing framework of biogeographical boundaries facilitating the spread of invasive species. The South American tomato moth, *Phthorimaea absoluta* (Meyrick) (Lepidoptera: Gelechiidae) originated in the Peru in South America^{1,2}. It is a serious pest on tomato in diverse parts of the world especially in South America. Tomato is a valuable vegetable crop with a major economic significance in India³. The existence of *P. absoluta* is expected to have a detrimental impact on tomato production. Its aggressive foraging leading to excessive crop destruction has earned it a key pest status in new regions it has invaded. It primarily feeds on the leaves of cultivated and wild solanaceous plants, including tomato (*Solanum lycopersicum*), potato (*Solanum tuberosum*), tobacco (*Nicotiana tabacum*), eggplant (*Solanum melongena*), thorn apple (*Datura* spp.) and weedy species such as black nightshade (*Solanum nigrum*)^{4,5}. The spread of *P. absoluta* is facilitated by the transportation of infested plant material, as well as favourable environmental conditions for the pest^{6,7}. Over 90 countries outside of South America have so far received *P. absoluta* because of the rapid growth of international trade and economic globalization⁸⁻¹⁰.