

Comparative Analysis of Allergenic Proteins in *Alnus nepalensis*, *Alnus glutinosa*, and *Betula pendula* Pollen

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Information/ Background

- Geographic and vegetation differences lead to regional variations in allergenic pollen. *Alnus nepalensis*, predominantly found in Southeast Asia, has been identified as a major airborne pollen in Yunnan, China, necessitating further investigation into its allergenicity.
- To compare the allergenic proteins of *Alnus nepalensis*, *Alnus glutinosa*, and *Betula pendula* pollen and identify the major allergens in *Alnus nepalensis*.

Materials and Methods

- Cross-reactivity were performed using sera from 70 Yunnan children sensitized to *Alnus glutinosa* and *Betula pendula* pollen.
- Western blotting (WB) determined the molecular weights of *Alnus nepalensis* pollen allergens.
- LC-MS/MS analysis identified the proteins while compared their sequences with those of *Alnus glutinosa* and *Betula pendula* pollen allergenic proteins.

Results

- Cross-reactivity revealed that *Alnus glutinosa* and *Betula pendula* pollen showed high self-inhibition rates (97.86% and 96.07%, respectively). Use plain, familiar fonts such as Arial, Calibri, or Times New Roman.
- Alnus nepalensis* pollen extract inhibited sIgE binding to *Betula pendula* and *Alnus glutinosa* by 91.07% and 95.50%, respectively. In contrast, *Betula pendula* pollen showed only 68.18% inhibition against *Alnus glutinosa*-sensitized sera, a finding inconsistent with previous literature reports.
- WB revealed potential *Alnus nepalensis* allergens at 10-17 kDa and 55-70 kDa.
- LC-MS/MS identified partial sequence homology with Aln g 1 (87.77%), Bet v 1 (87.05%), Aln g 4 (100%), Bet v 2 (55%), Ole e 5 (61.3%), Bet v 4 (86.36%) and Bet v (84.88%).

Conclusion

Alnus nepalensis pollen shares allergenic components with *Alnus glutinosa* and *Betula pendula* but exhibits distinct major allergens. *Betula pendula* allergens do not fully cover the sensitization profile of *Alnus nepalensis*.

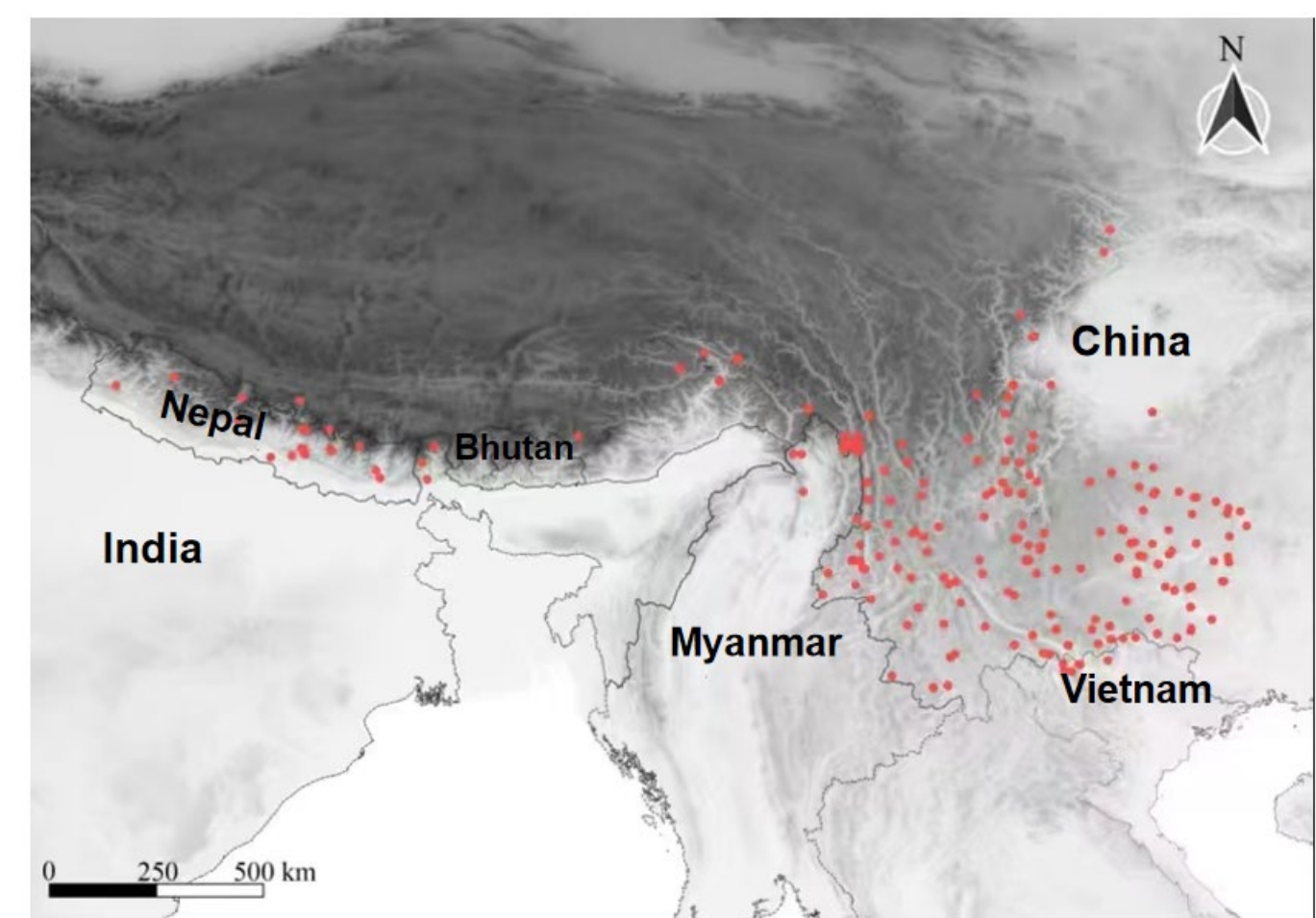


Figure 1 Distribution Map of *Alnus nepalensis*

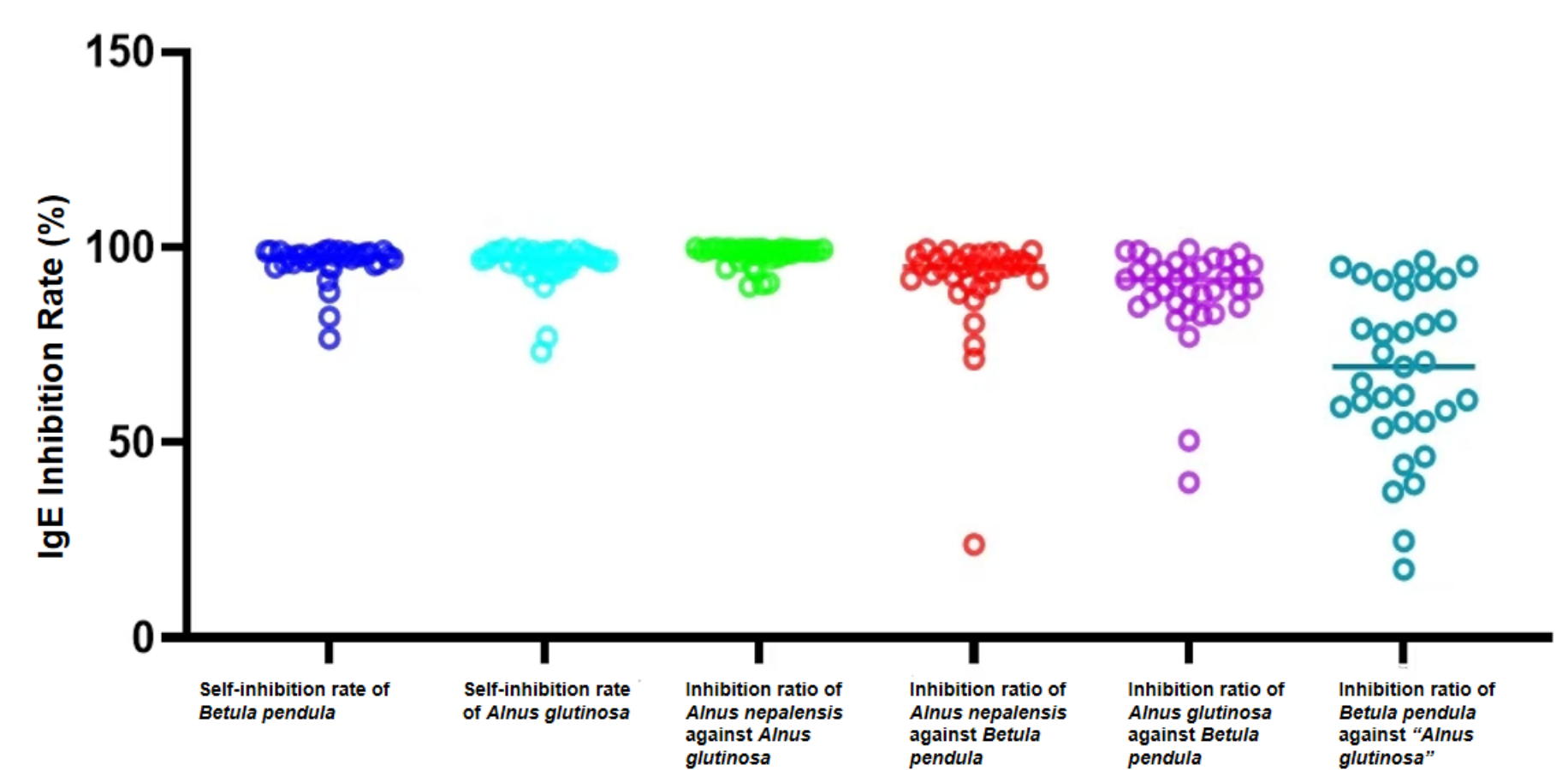


Figure 2 Cross-Inhibition Experiment

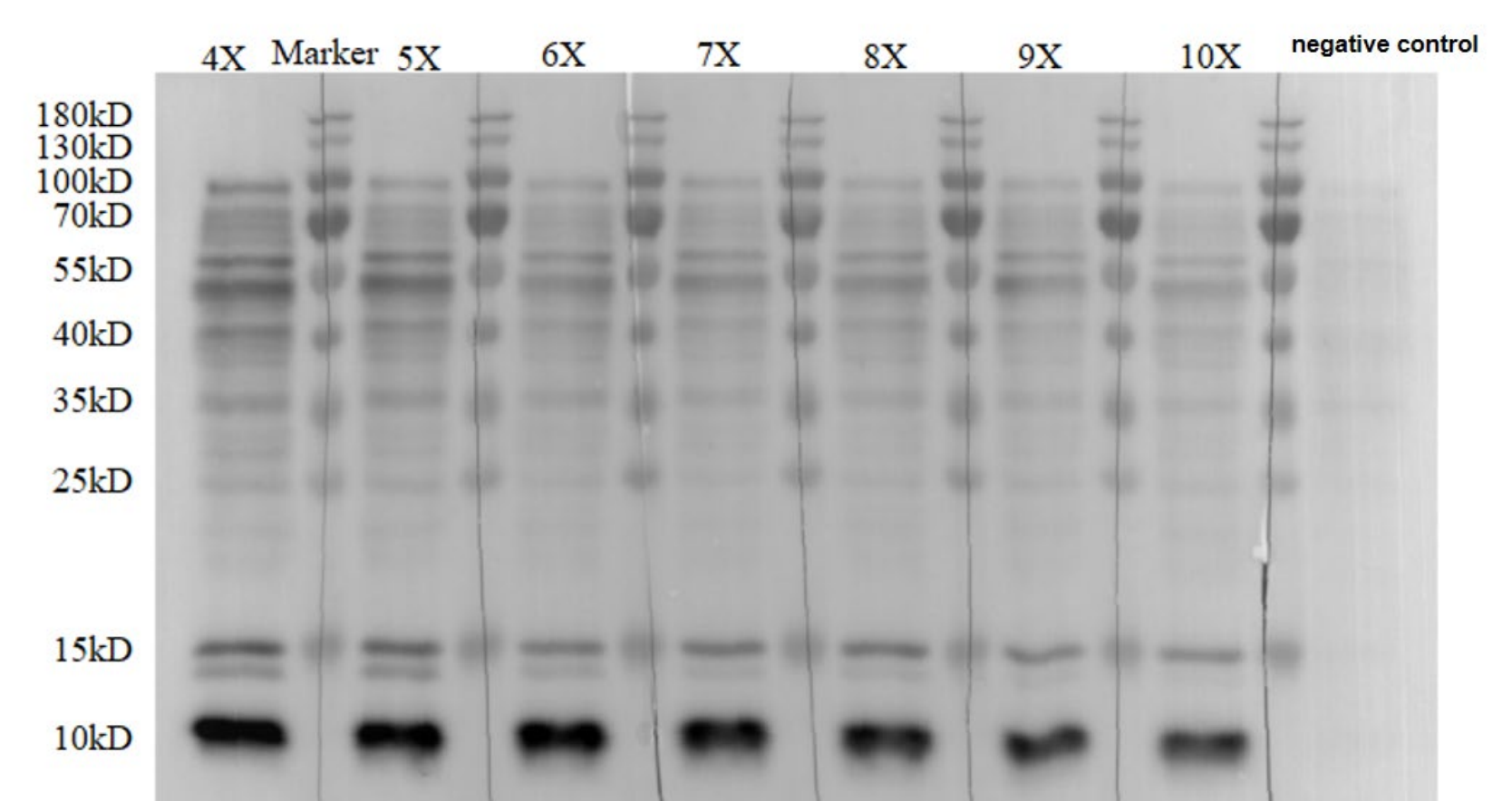


Figure 3 Western Blot Analysis of *Alnus nepalensis* Pollen Allergens Reacting with Positive and Negative Human Serum Pools