The Development of Microsatellite Markers for Endangered Orchids to Inform Global Conservation Efforts

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Key Words

Microsatellite - short, repetitive segment of DNA in non-coding regions of genome - highly polymorphic genetic marker
Chromatogram - graph depicting the separation of nucleotide bases
Primer set - synthetic nucleotide sequence designed to anneal with specific sites on the DNA template

Background

- ❖ 83% of the planet's biomass is made up of plants, Orchids are the largest family of plants (Orchidaceae)
- ❖ Lady's slipper orchids are important indicators of biodiversity decline
- ❖ Terrestrial orchids exist in narrow climate conditions and are highly sensitive to environmental changes
- ❖ Genomic analyses of slipper orchids provide information for global biodiversity decline
- ❖ Analyzing the genetic diversity of showy lady's slippers using microsatellite markers can provide key insights into biodiversity decline, thereby informing efforts to prevent regional extinction`

Methods

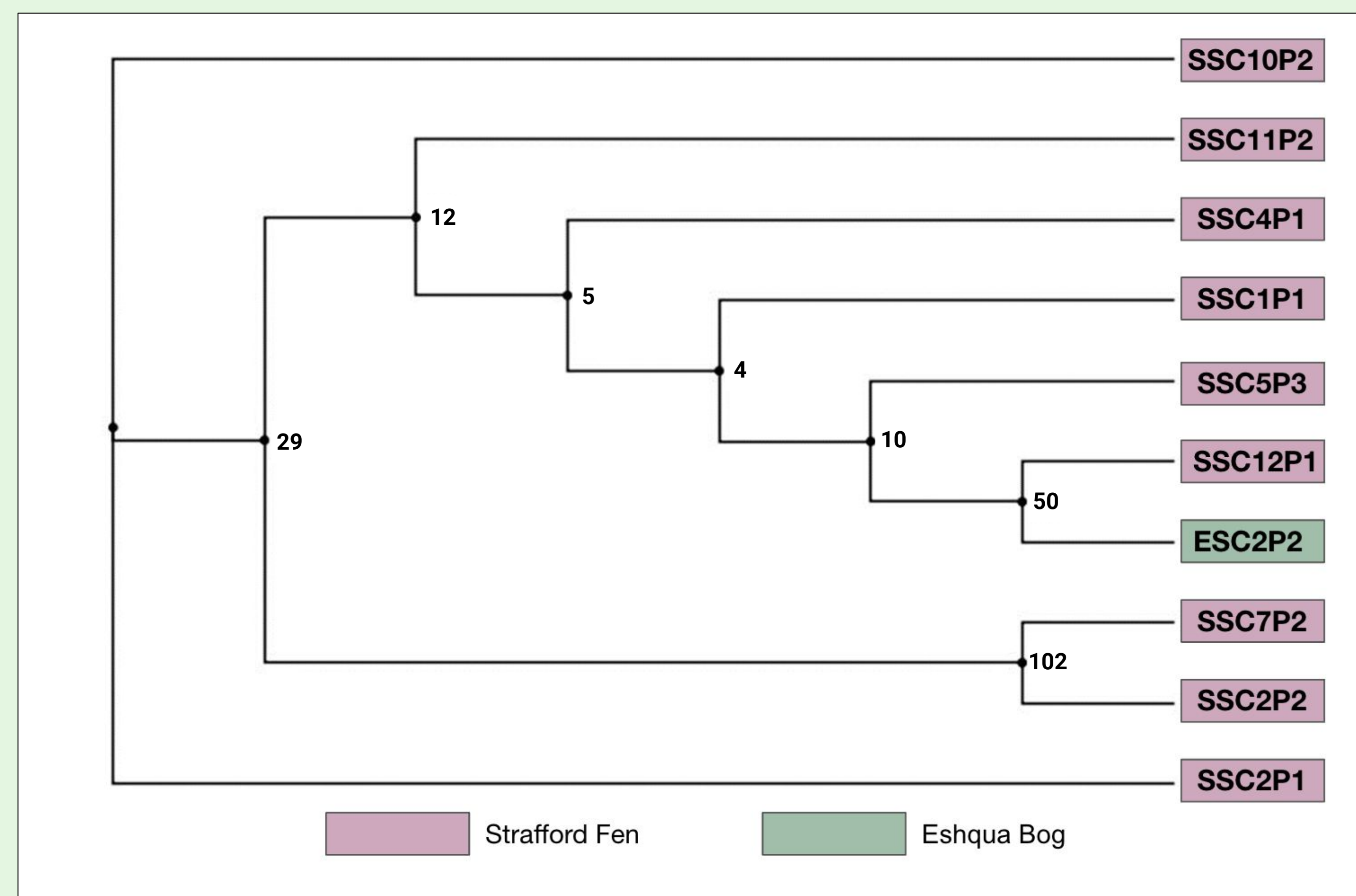Extract DNA → PCR → Gel Electrophoresis → Chromatogram
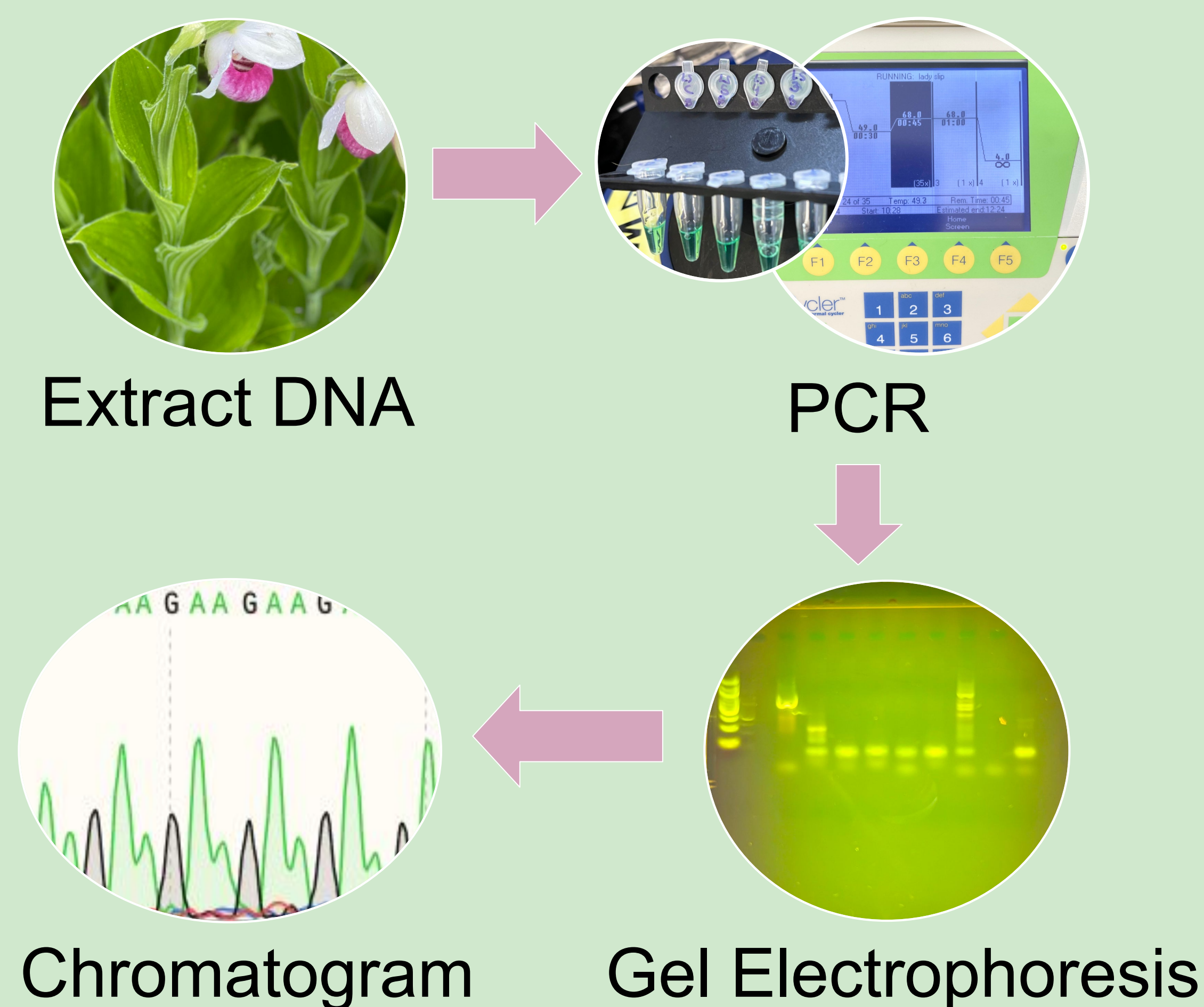
Phylogenetic Analysis

Figure 1. Cladogram of phylogenetic relationship among individuals using primer M209 across 2 fens

Strafford Fen   Eshqua Bog

Conclusions

8 out of 20 microsatellite primer sets tested can aid in conservation of endangered showy lady's slippers orchids

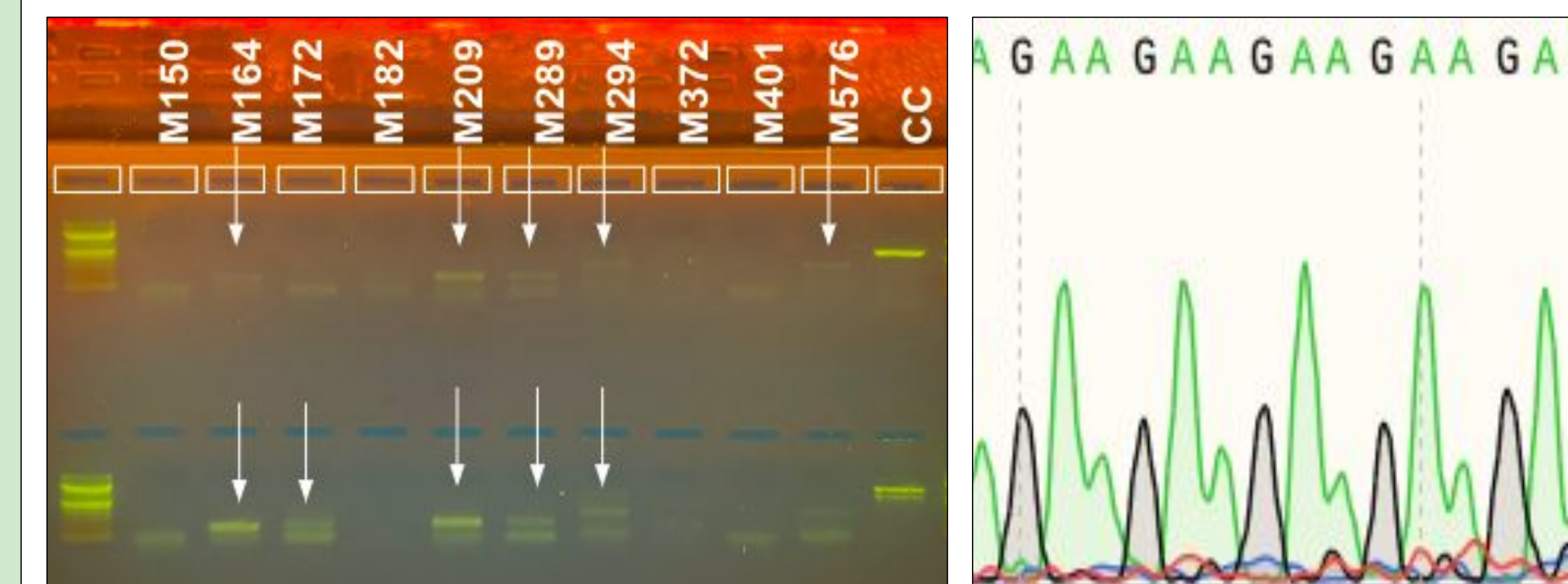## Gel and Chromatogram Results

Fig. 2. A representative gel showing amplification of *Cyp. reginae* DNA using 10 of the 20 primers tested and a chloroplast control.

Fig. 3. An example of a clean chromatogram with a repetitive sequence and limited baseline noise from primer M289.

Future Directions

- ❖ Sequence entire genome of *Cyp. reginae*
- ❖ Bioinformatic analysis of sequences to find similarities and differences between species.
- ❖ Developing a reference genome will transform terrestrial orchid conservation research

Acknowledgments