

ABSTRACT

Variation in seed progeny of *Heliconia psittacorum* L.f.

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This study has three parts, attempts to improve the germination of heliconia seeds, particularly *H. psittacorum* L.f., an assessment of morphological variation in *H. psittacorum* seed progeny, and an investigation of the use of RAPD-PCR to determine paternity of progeny of this species. All of this was done against the background of the demands of the International market for a continuous line of colourful and intriguing, top quality heliconias.

The germination study was designed to provide ways to increase the rate and final germination. Results indicated that, for some cultivars of *H. psittacorum*, a rest period of 12d was more beneficial than one of 100d. Sulphuric acid scarification reduced the time to first germination by 40d for seeds from cv. Nadja and increased final germination percentage for this cultivar, *H. caribaea* cv. Chartreuse and *H. rostrata*. Germination was also improved substantially by treatment with 0.1M gibberellic acid or a period at 37°C. The optimum incubation period was 5d.

Progenies from the germination tests were used to assess variation in morphological characteristics of *H. psittacorum* seedlings. This confirmed the wide variation in colour forms of the species. Although 42% of the progeny came from a pink clone ('Nadja'), orange and red-orange were the dominant floral part colours generated by all the parental material. The amount of variation found in the colours of bracts, sepals, rachis and pedicel is indicative that this species has a wide genetic base. Greater variation existed in bract colour than any other floral part. Other morphological traits (stem length, sepal length and inflorescence length) showed very little variation. Selections have been made from the most "attractive" progeny, these include 'Dame Nita', 'Sir Garry' and CC066.

Only one parent is known for these seedlings. Therefore they could be the result of either intraspecific hybridisation or selfing. The ability to determine paternity is necessary if the crosses are to be repeated artificially. 'Dame Nita' derived from 'BB Red' was used to see whether RAPD-PCR could be used to determine paternity. This suggested that 'Dame Nita' was most closely related to *H. psittacorum* cv Parakeet. These results indicate that this technology can be used to resolve kinship relationships in *Heliconia*.

During this last part of the study, a protocol for the isolation of DNA from *Heliconia* was developed and it was established that a simple mathematical equation could be used to determine the sizes of bands on the gels of PCR products.