AUTHENTICATION AND DIFFERENTIATION OF *HEVEA BRASILIENSIS* CLONES USING MICROSATELLITE MARKERS

Thakurdas Saha, C. Bindu Roy, Minimole Ravindran and K. Bini

Rubber Research Institute of India, Kottayam-686 009, Kerala, India

Received: 04 April 2025 Accepted: 02 May 2025

Saha, T., Roy, C.B., Ravindran, M. and Bini, K. (2025). Authentication and differentiation of *Hevea brasiliensis* clones using microsatellite markers. *Rubber Science*, **38**(1): 1-9.

Cultivated *Hevea brasiliensis* clones of the South East Asian rubber growing countries have their origin from 'Wickham clones'. Since the cultivated clones are characterized with a low genetic variability, it is difficult to identify them based on their morphological characteristics. Therefore, DNA-based markers were used for accurate identification through genotyping of *H. brasiliensis* clones, which is essential for maintaining genetic purity of cultivated clones. We developed microsatellite markers that could discriminate *H. brasiliensis* clones, used for cultivation or maintained for breeding purposes in India. Thirty-eight popular clones could successfully be identified using only three polymorphic microsatellites. In order to identify the clones, microsatellites *hev-glu* (intronic TC repeats of *β-1,3 glucanase* gene), *hmct19* and *hmac14* (generated from *Hevea* genomic library) were used sequentially in descending order of their powers of discrimination. These three microsatellite markers could independently discriminate 10 clones based on their unique allelic profiles. Among these three markers, *hev-glu* with its high discriminatory power (0.916) could identify six clones based on their characteristic allelic combinations. Similarly, *hmct19* and *hmac14* uniquely discriminated two clones each originating from Sri Lanka and Malaysia. Using the marker *hev-glu,* rest of the 32 clones were grouped into 10 clusters/ genotypes. When these individual groups comprising 32 clones were assessed for the locus *hmct19,* 21 clones could be identified and 11 clones remained unidentified. Following application of the marker *hmac14*, all remaining 11 unidentified genotypes could clearly be differentiated. Thus, the above markers can be used effectively to resolve any dispute concerning clonal identity in rubber.

Keywords: Clone identity, *Hevea brasiliensis*, Microsatellites, Molecular markers

INTRODUCTION

Hevea brasiliensis is an important tree crop producing latex of commercial utility. Cultivated *Hevea* clones of the South East Asian rubber growing countries primarily originated from 'Wickham clones' (Clément Demange *et al*., 2007). Since the cultivated clones are characterized with low genetic variability (Priyadarshan, 2017), it is difficult to identify them based on their morphological characteristics. Moreover, morphological plasticity may also lead to erroneous identification of the clones. With the introduction of plant variety rights for protection of proprietary germplasm, cultivars and clones, their proper identification becomes an important issue. In order to be eligible for plant variety registration and IP protection, a candidate variety must meet the criteria of

Correspondence: Thakurdas Saha (Email: tdsaha58@gmail.com)