Human mediated translocation of Pacific paper mulberry [Broussonetia papyrifera (L.) L?Hér. Ex vent. (Moraceae)]: Genetic evidence of dispersal routes in Remote Oceania

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Paper mulberry, Broussonetia papyrifera (L.) L?Hér. ex Vent. (Moraceae), a dioecious species, was transported by humans from Taiwan to the islands of Remote Oceania. Its introduction and cultivation in Remote Oceania was intentional due to its cultural importance as a fiber source for barkcloth textiles. The aim of this study was to explore the genetic diversity and structure of paper mulberry populations within Remote Oceania in order to infer dispersal patterns that may reflect past human interaction among island groups. We present the integrated analysis of 380 samples (313 contemporary and 67 herbarium specimens) collected in Near and Remote Oceania. Genetic characterization was based on a set of ten microsatellites developed for B. papyrifera and complemented with the analysis of the ribosomal internal transcribed spacer ITS-1 sequence, a sex marker and the chloroplast ndhF?rpl32 intergenic spacer. Microsatellite data identify a total of 64 genotypes, despite this being a clonally propagated crop, and show three major dispersal hubs within Remote Oceania, centered on the islands of Fiji, Tonga, and Pitcairn. Of 64 genotypes identified, 55 correspond to genotypes associated to female-sexed plants that probably descend

from plants introduced by the prehistoric Austronesian-speaking voyagers. The ratio of accessions to genotypes between herbarium and contemporary samples, suggests recent loss of genetic diversity. In addition to the chloroplast haplotypes described previously, we detected two new haplotypes within Remote Oceania both originating in Taiwan. This is the first study of a commensal species to show genetic structuring within Remote Oceania. In spite of the genetic bottleneck, the presence of only one sex, a timespan of less than 5000 years, and asexual propagation of this crop in Remote Oceania, we detect genetic diversity and regional structuring. These observations suggest specific migration routes between island groups within Remote Oceania.