

UNDERSTANDING GENETIC DIVERSITY AND FARMER NAMED VARIETIES IN TARO (*COLOCASIA ESCULENTA* L. SCHOTT), BARLEY (*HORDEUM VULGARE* L.), AND RICE (*ORYZA SATIVA* L.) IN THE MID AND HIGH HILLS OF NEPAL THROUGH ISOZYME AND MICROSATELLITE DNA ANALYSIS

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Genetic diversity of local farmer-named varieties of rice (*Oryza sativa* L.), barley (*Hordeum vulgare* L.) and taro (*Colocasia esculenta* L.) were assessed using germplasm collected in 1998-2000 from three agroecosystems in Nepal. Microsatellite DNA markers were used to evaluate rice landraces whereas isozyme analysis was used in barley and taro. In rice, a low level of polymorphism was revealed among farmer-named variety accessions with an average 0.40 polymorphic information content (PIC). The farmer-named varieties exhibited close relationships with little variation in landraces with same name maintained by different farmers. This suggests that landrace names adopted by farmers based on the phenotypic characteristics of panicle and grains are inconsistent indicators of genetic identity in high altitude areas where natural selection for low temperature is strong. Overall, these landrace accessions under study have little genetic variation suggesting that farmers' rice cultivars from Jumla be probably selected from locally common Jumle Marshi landrace. In Barley, isozyme data indicated the existence of diversity within and between populations of the four farmer-named varieties irrespective of the agroclimatic and altitudinal ranges. This variation could possibly be as a result of the farmers' management practices, particularly the different seed exchange systems. In taro the observed variation in isozyme profiles indicated the existence of genetic difference in farmer-named taro cultivars. Principal component analysis and UPGMA cluster analyses of these isozyme data sets provided the evidence that these cultivars possess considerable genetic variation and clustered the entire set of cultivars into two distinct groups irrespective to morphological classification.