Summary: The Hengduan Mountain region is one of the biodiversity hotspots of the world. We aimed to examine the karyotypes of nine seed plants from the alpine subnival belt of this region in the present study. By using the plant root tip cytology research method, the results showed that karyotype formulae and karyotype asymmetry were: Eriophyton wallichii with $2n = 2x = 16 = 4m + 12sm$, 2B; Marmoritis complanatum with $2n = 2x = 18 = 10m + 8sm$, 4A; Lamiophlomis rotata with $2n = 2x = 22 = 12m + 10sm$ (2SAT), 3A; Codonopsis bulleyana with $2n = 2x = 16 = 8m + 8sm$ (2SAT), 3A; Pedicularis elwesi with $2n = 2x = 16 = 2m + 14sm$ (2SAT), 3A; P. rupicola with $2n = 2x = 16 = 4m + 12sm$ (2SAT), 2A; the two populations of Rheum nobile as follows $2n = 2x = 22 = 18m$ (2SAT) + 4sm, 3A and $2n = 2x = 22 = 16m$ (2SAT) + 6sm, 4A; Senecio muliensis with $2n = 4x = 40 = 32m$ (4SAT) + 8sm, 3A; Soroseris hookeriana with $2n = 4x = 32 = 22m$ (4SAT) + 10sm, 4A. The chromosome numbers and karyotype of Eriophyton wallichii, Marmoritis complanatum, Codonopsis bulleyana, Pedicularis elwesi, P. rupicola, Senecio muliensis were reported for the first time. Except for Senecio muliensis and Soroseris hookeriana, all of the sampled endemic species were diploid, and showed that polyploidy may not play an important role in the way of adapted extreme alpine subnival belt environment of these plants from the Hengduan Mountains.

The Hengduan Mountain region (HDM), which is located at the eastern edge of the Qinghai-Tibetan Plateau region, is known as one of the 25 most significant biodiversity hotspots in the world (Olson and Dinerstein 2002, Myers et al. 2000). It is also one of the areas of the world with a large number of endemic species. More than 8000 species belonging to 1300 genera have been recorded in this region (Wu 1988, Li and Li 1993). The alpine subnival belt of the HDM is one of the richest alpine subnival belt flora in the world. In it, 942 seed plant species of 168 genera and 48 families have been recognized (Xu et al. 2014a, 2014b, Wu et al. 1995). We will focus on the cytology of the representative species from alpine subnival belt, such as family Lamiaceae (Eriophyton wallichii, Marmoritis complanatum and Lamiophlomis rotata), Asteraceae (Senecio muliensis and Soroseris hookeriana), Polygonaceae (Rheum nobile) and so on.

Cytological study plays an important role in understanding plant chromosome diversification and evolution at the chromosome level (Hong 1990, Kikuchi et al. 2006). From research on endemic species, we can find implications of previous climate variation and extinction events with species evolutionary history (Myers et al. 2000). However, there have been few published studies about chromosome number and karyotype in the HDM due to the extreme natural environments and hampered by the lack of transportation (Nie et al. 2004, 2005). In this study, we examined the karyotype of nine endemic plants from the alpine subnival


