Phylogenetic analyses of *Rhododendron* confirm Goetsch et al.'s (2005) findings, but reveal multiple transitions between corolla monosymmetry and polysymmetry within the genus, contradicting Leppik's (1974) assertion of monosymmetry as a derived state. Clade A exhibits the most character state variability and lability, uniquely possessing deflexed styles. Analyses tested correlations between floral monosymmetry and pigment patterns, and monosymmetry's derived status. Maximum parsimony suggests an ancestral monosymmetric *Rhododendron* with pigment patterns, but corolla symmetry remains uncertain; maximum likelihood provides ambiguous results. The Indian species' phylogenetic placement aligns with traditional subgeneric classification, but sectional classification lacks strong support. Strong evolutionary correlations exist between monosymmetry in different floral whorls (except between bundled stamens and flexed styles). Pigment patterns are closely linked to monosymmetry types in the corolla, androecium, and gynoecium, suggesting co-evolution possibly driven by pollinator selection. Further research in plant ecology, floral development, and genetics is needed. While pollination data is limited, some monosymmetric species with spots/blotches, reflexed stamens, and flexed styles are known to be pollinated by bees or butterflies, while some polysymmetric species are bird-pollinated. Previous studies primarily focused on perianth symmetry or symmetry-governing genes. Fossil evidence indicates floral monosymmetry evolved ~50 Myr ago, coinciding with pollinator diversification. Comparative developmental studies could elucidate the lability of traits influencing floral symmetry. *Rhododendron* flowers are generally pollinated by bees, bumblebees, butterflies, and potentially flies and birds.