

foundation, and a stable chestnut-like aroma style. At the same time, its relatively high contents of flavonoids, flavonols, and free fatty acids provide a metabolic basis for aroma formation and mouthfeel expression (Zeng et al., 2024). Therefore, teas made from Longjing 43 usually exhibit fresh, balanced, and stable overall quality characteristics. Although in some cases its aroma complexity is slightly simpler than that of traditional population varieties, its industrial adaptability and commercial consistency are stronger. Notably, Longjing 43 is not only a major production cultivar but has also become an important model material in tea plant basic research. Its high-quality chromosome-level genome assembly has shown that gene loci related to flavor formation, metabolic regulation, and disease resistance underwent strong selection during tea domestication (Gao et al., 2023a). The establishment of this genomic resource has not only enhanced the understanding of the mechanisms underlying the superior traits of Longjing 43, but has also provided a theoretical basis for subsequent marker-assisted breeding, target metabolite-oriented improvement, and the breeding of specialized cultivars for Longjing-type tea processing.

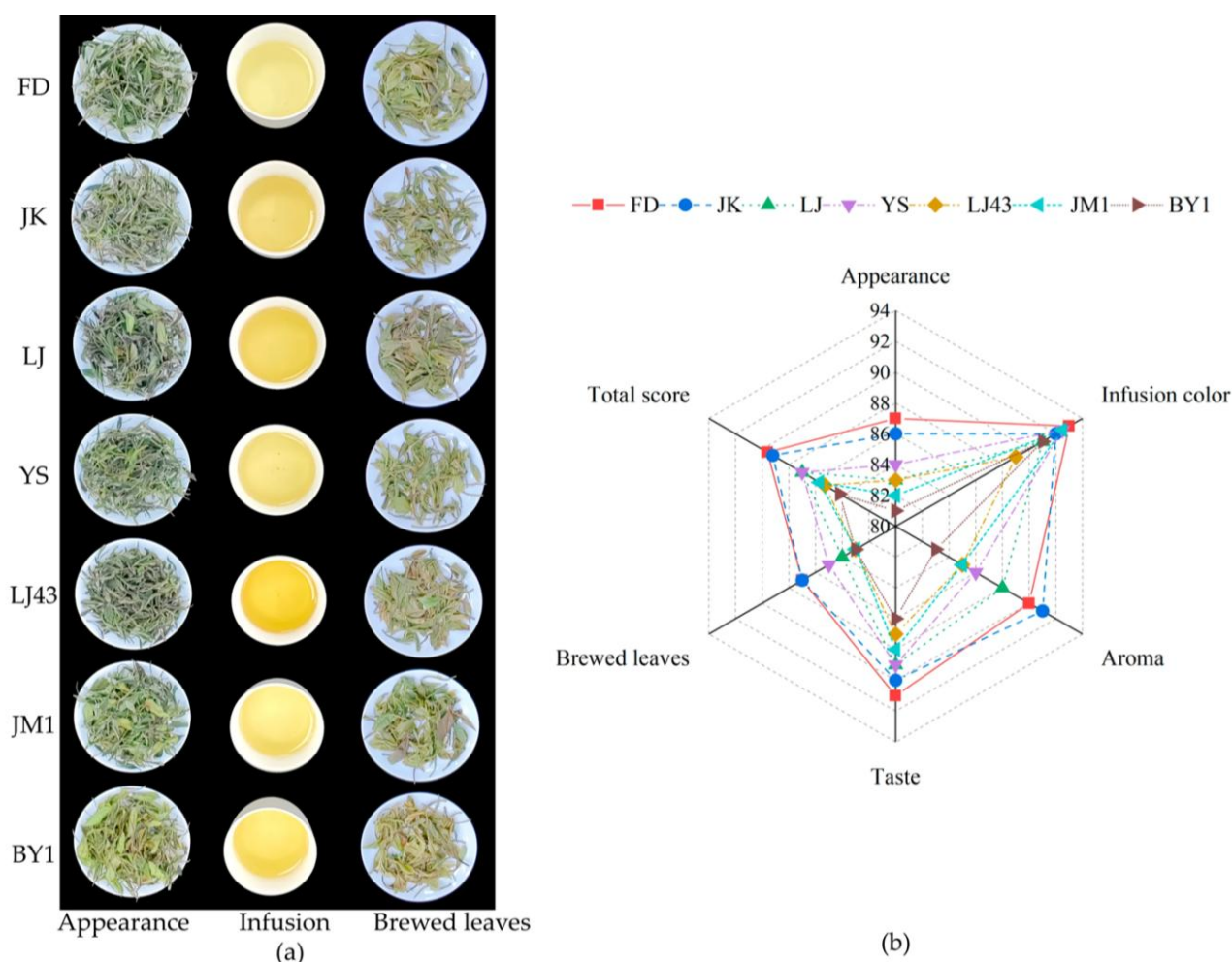


Figure 2 The sensory qualities of HGW (Adopted from Ao et al., 2025)

Image caption: (a) The photos of tea samples, infusions, and brewed tea leaves. (b) Evaluation of each quality factor and calculation of the total score (Adopted from Ao et al., 2025)

3.2 Promoted cultivars

With the expansion of the Longjing tea industry and increasing market demand for early harvesting, high yield, strong processing suitability, and cross-regional adaptability, a group of promoted cultivars has gradually been applied in Longjing tea production. Among them, Wuniuzao is a typical extremely early-sprouting cultivar. Because of its early spring bud break and significantly advanced market entry, it has high economic value, especially for capturing the early-spring premium tea market. The fresh leaves of Wuniuzao are relatively tender and show good potential for appearance formation, producing fairly uniform flat green tea under proper harvesting