

observed in commercial cultivars fundamentally arises from recombination and directional selection of parental traits.

In terms of morphological traits, cultivars also differ significantly in flower diameter, peduncle length, inflorescence orientation, and flower number per spike. Analysis of 19 quantitative traits across 15 hybrid *Phalaenopsis* genotypes revealed distinct morphological groupings (Hartati and Samanhudi, 2024). Further studies on six species and 17 horticultural hybrids showed that inflorescence orientation varies from erect to semi-erect, arching, and pendant, and is closely associated with the degree of lignification in the inflorescence axis (Pramanik et al., 2022). The Indonesian cultivar Puspita Devi Agrihorti, for example, exhibits relatively large flowers (approximately 8.7-8.9×8.2-8.5 cm), long peduncles (50.6-88.2 cm), and 9-20 flowers per spike, showing clear differences from comparison cultivars such as Ayu Pujiastuty and Indu Pramesi (Figure 4) (Nurmalinda et al., 2023).



Figure 4 Candidate Varieties of *Phalaenopsis* 1 (Puspita Devi Agrihorti) (Adopted from Nurmalinda et al., 2023)

4.2 Influence of trait differences on ornamental value

The ornamental value of *Phalaenopsis* arises from the integrated expression of flower color, morphology, and overall plant structure. Among these, flower color is the primary factor influencing first visual impression. Bright or highly contrasting colors tend to attract immediate attention, whereas soft and uniform color tones provide a more stable and enduring aesthetic appeal (Han et al., 2025). Consumer preference studies indicate that cultivars with harmonious combinations of color and pattern are more likely to be favored. For example, Puspita Devi Agrihorti achieved a first-choice preference rate of 35.9% in surveys, highlighting the importance of integrated color design in determining ornamental value (Nurmalinda et al., 2023).

Differences in floral morphology further enhance the viewing experience. Cultivars with large, symmetrical petals often present a fuller and higher-quality visual impression, while more elongated or loosely arranged floral forms convey a natural and dynamic aesthetic. The labellum (lip) plays a particularly important role in visual focus, with its structure and color contrast contributing to increased depth and complexity (Figure 5). Petal texture also influences perception; velvety petals enhance softness and elegance, whereas waxy petals increase glossiness and durability (Han et al., 2025).

In addition, the combination of flower size and flower number determines the mode of visual presentation. Cultivars with fewer but larger flowers emphasize individual floral refinement, whereas those with numerous smaller flowers create a fuller overall display. At the whole-plant level, the coordination between inflorescence structure and plant architecture is equally critical. Cultivars with erect, self-supporting inflorescences provide better display quality and a more orderly appearance (Pramanik et al., 2022). Therefore, ornamental value is not determined by a single trait, but by the synergistic interaction of color, floral form, and plant structure.