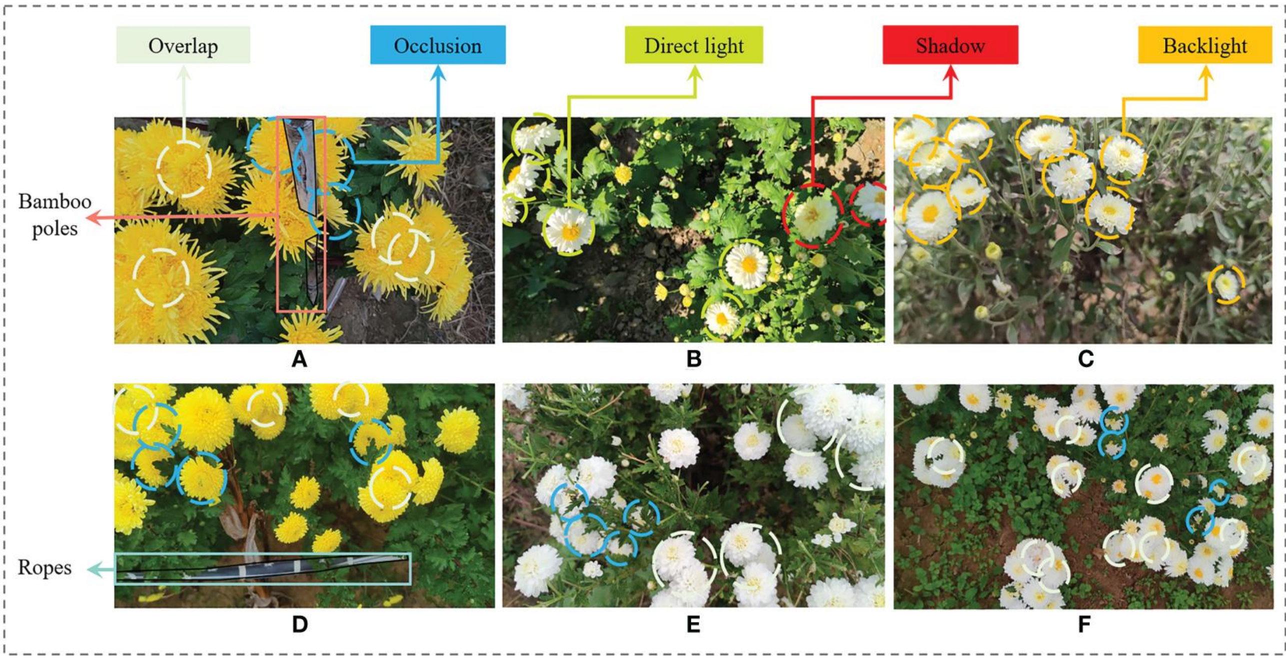

Figure 3 The category to which the sample images belong and their number in the related chrysanthemum dataset: (A) Jinsihuangju-01314, (B) Hangbaiju-00063, (C) Bo-chrysanthemum-11093, (D) Wuyuanhuangju-03285, (E) Gongju-00002, and (F) Chuju-00110 (Adopted from Zang et al., 2023)

For bloom-stage aphids, Cao et al. developed a control approach that combines olfactory and visual cues: a complex aphid sexual attractant (composed by mixing seven plant volatile components with nepetalactone at a specified volume ratio) was used to bait chrysanthemum-yellow sticky boards. Traps were deployed in Hangbaiju fields with spacing of 7 m × 8 m, and the trap bottom positioned just above plant tops (≈1 cm in the described setup) (Cao et al., 2024).

For soil-borne wilt management, the Hangbaiju Fusarium study identifies *F. incarnatum* as the pathogen and evaluates metabolites of *Streptomyces diastatochromogenes* 1628 as a biocontrol input. The study design includes in vitro inhibition endpoints and pot-trial evaluation, which is typical of microbial biocontrol development pipelines where greenhouse/pot performance is used as a bridge toward field formulation and delivery.

A practical integrated implementation, faithful to these sources, would therefore deploy microbial protection preventively (pre-plant or early growth) and rely on non-spray "clean harvest" interventions during bloom. In my experience reading the chrysanthemum biological control literature, this split design—microbes early, traps/low-residue tools late—often aligns better with on-farm logistics than trying to replace every chemical spray with a biological spray at the same timing (Serrão et al., 2024).

5.3 Analysis of control effectiveness

For the bloom-stage aphid problem, the published evidence emphasizes qualitative superiority of the trapping strategy relative to chemical spraying in the described field context. The Acta Ecologica Sinica paper reports that the chrysanthemum-yellow sticky boards baited with the complex sexual attractant caught "a large number" of aphid adults and that their control effect on the aphid population was "significantly superior" to spraying imidacloprid. The study also provides behavior-based evidence supporting mechanism: multiple volatile components at specified concentrations attracted adult aphids, and yellow color was slightly more attractive than bud green in field phototaxis trials (Cao et al., 2024). For wilt suppression, the Hangbaiju Fusarium/ Streptomyces study reports measurable protective and therapeutic effects in pot tests, with a consistent pattern that protective effects exceed therapeutic effects. This is a meaningful signal for implementation: the biological control input should be deployed before severe vascular symptoms, consistent with the broader Bacillus meta-analysis finding that preventive inoculation generally yields higher efficacy than therapeutic use across many plant disease contexts.