

Abstract of thesis entitled

**PATTERNS OF SEED DEPOSITION IN THE UPLAND
LANDSCAPE OF HONG KONG**

Submitted by

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Hong Kong is an extreme example of tropical deforestation, with no substantial remnants of the original forest cover and a highly impoverished disperser fauna. Seed availability is therefore a potential limiting factor in vegetation recovery. Studies were conducted in the major hillside vegetation types on Tai Mo Shan, Hong Kong, to assess the quantity and quality of the seed rain from the woody flora. Seed traps were placed in fire-maintained grassland, shrubland, and secondary montane (> 600 m) and lowland forests. Within the grassland site, traps were placed under isolated trees, isolated male and female shrubs of *Eurya chinensis* (Theaceae), and in the open. Seeds were collected every two weeks for 1-3 years.

Seed rain was highest under female shrubs in grassland (6829 seeds m⁻² year⁻¹), where it was almost entirely confined to their fruiting period. The next highest was isolated trees (817), followed by a streamside strip of montane forest (577), male isolated shrubs (561), shrubland (558), lowland forest (129), montane forest (101), and open grassland (35). The seed rain differed in species composition between the spatially separated sites. Birds (particularly bulbuls,

Pycnonotus spp.) are known or inferred to be the major dispersal agents for 85% of the seed taxa trapped, 99% of the total number of seeds trapped, and 99.9% of the seeds trapped in grassland. Few taxa and < 1% of the total seeds were dispersed by wind, and 2 taxa and < 0.1% of the total seeds were dispersed solely by fruit bats. The total seed rain represented 35-63% of the taxa growing within 1.5 m radius of the seed traps. Dispersal distances estimated by recapturing fluorescent-marked fruits of *Eurya chinensis* and *Rubus reflexus* in grassland were 7-370 m (medians 53 m and 26 m) and those for *Schefflera heptaphylla* in shrubland were 13-117 m (median 46 m).

The density and diversity of seedlings germinated from exposed top-5 cm soil and from soil covered for 3 and 9 months were highest in lowland forest, while soil covered for 6 months had the highest seedling density and diversity in the shrubland. Five of the 7 seed taxa tested retained > 80% viability after 9 or 12 months burial, while the others lost 92-98% of their viabilities after 9 months. Seedling density in the grassland site was highest under isolated trees (3.29 m⁻²), followed by isolated shrubs (1.97 m⁻²), while the open grassland was lowest (0.06 m⁻²).

The results suggest that even in the most degraded landscape the seed rain is adequate for the development of woody vegetation cover, but as most of the dispersal relies on relatively narrow-gaped birds, which limits the diversity of the regenerated vegetation, human intervention will be needed for the restoration of plant diversity. Protection of woody seedlings against the increasing population of feral cattle may also accelerate woody regeneration.