List of Figures

Figure 1: a. *Panax pseudoginseng* plant; b. *Panax pseudoginseng* rhizome; c. *Panax pseudoginseng* inflorescence; d. *Panax pseudoginseng* fruits.


Figure 3: Map of Nagaland showing the four study areas (natural and artificial).

Figure 4: a. *Panax pseudoginseng* plants in natural habitat; b. Associated species growing in the natural habitat along with *Panax pseudoginseng*.

Figure 5: a. *Panax pseudoginseng* in Aradura hill showing stunted growth; b. 2-leaves and non-flowering plant; c. *Panax pseudoginseng* plants established in green house in Mokokchung; d. *Panax pseudoginseng* fruits showing non-seed bearing umbel.

Figure 6: a. *Panax pseudoginseng* inflorescence; b. *Panax pseudoginseng* floral buds; c. Flowers at bloom; d. An enlarged flower showing the different floral parts; e. Anther dehiscence; and f. *Panax pseudoginseng* stigmatic lobe.

Figure 7: a. *Panax pseudoginseng* umbel inflorescence bearing immature fruits; b. Umbel with matured fruits; c & d. One and two seeded berries.

Figure 8. *Panax pseudoginseng* plants of different leaf class stages. a. 1-leaf plant; b. 2-leaves plant; c. 3-leaves plant and d. 4-leaves plant.

Figure 9: a & b. Seed bed preparation; c & d. Seedling developed from germinated seed; e. Young plants in the pots; f. One year old plantlets of *Panax pseudoginseng* ready for transfer to the field.

Figure 10: Map of Nagaland showing the natural habitats of *Paris polyphylla* studied.

Figure 11: *Paris polyphylla* in all the natural habitats studied; a. Chida area under Khezakenoma village (Phek district); b. Pangsha area (Tuensang district); c. Aradura Hill (Kohima) and d. Longkum village forest area (Mokokchung).

Figure 12. a. *Paris polyphylla* habitat; b. Associated species in area where *Paris polyphylla*.

Figure 13. a. Horizontal rhizome of *Paris polyphylla*; b. Rhizome showing transverse rings; c. Formation of buds before the senescence of the above ground plant body; and d. Sprouted buds formed plants.
Figure 14: a. Plants with young leaves and inflorescence forms as closed whorl; b. Formation of compound plants from rhizome; c. Formation of single plant from rhizome; d. Formation of new shoots in mid-season when plants are at bloom.

Figure 15: a. A clump showing flowering plants; b. A clump showing non-flowering plants.

Figure 16: a. *Paris polyphylla* in full bloom; b. Early stage of bloom with closed whorl; c. Purple stigma; d. Flowers showing leafy green outer tepals and yellowish green, filiform inner tepals.

Figure 17: Possible pollinators of *Paris polyphylla* a. Flies; b. Bee; and c. Pollens dehisced on tepals.

Figure 18: a. *Paris polyphylla* ovary before pollination; b. Ovary during and after pollination; c. *Paris polyphylla* anthers arranged in two whorls; and d. Typical arrangement of inner and outer whorls of *Paris polyphylla* Smith.

Figure 19: a. Recalcitrant rhizome failed to form shoot buds during growing season; b. Sprouting of shoot buds from rhizome and formed plantlets.

Figure 20: a. Disintegration of floral parts of *Paris polyphylla* after pollination and formation of young fruit; b. Developing ovary (globular capsule type); c. The developed ovary dies off without forming seeds; and d. Post-fertilized ovary premature death along with floral parts.

Figure 21: a. Mature fruit of *Paris polyphylla* with bright orange seeds; b. Fruits bearing fewer seeds when maintained at higher light intensity; c. Mature fruit slit opening exposing the seeds; and d. Predators affecting *Paris polyphylla* fruit.

Figure 22: a. *Panax pseudoginseng* rhizome with scars and rootlets; b. Horizontal cut of root; c. *Panax pseudoginseng* rhizome segment; and d. Inclined cut of root.

Figure 23: a. *Paris polyphylla* rhizome with multiple shoot buds; b. Rhizome fragment with single shoot bud; c. Rhizome fragment with multiple shoot buds; and d. Compound rhizome of *Paris polyphylla*.

Figure 24: a. Sprouting of shoot bud from rhizome fragment of *Panax pseudoginseng*; b. Regenerated plants in the bed ready for transfer in the wild; c. One rhizome segment with shoot bud and rootlet; and d. Development of 1-leaf plant from inclined root cutting.
Figure 25: a. Sprouting of shoot bud from the rhizome segment of *Paris polyphylla*; b. Plantlets developed from the sprouted shoot buds; and c. Regenerated plants in the bed.