tissue for sectioning. The objects were too large to be totally infiltrated, thus impossible to obtain perfect sections.

The only manageable examination was that of the embryos extracted from the hybrid seeds observed under light microscope. These embryos resembled those of monocotyledonous plants.

Failure in this experiment suggested that other means of obtaining better sections of young embryos inside developing hybrid seeds are needed since progressive development of those embryos can reveal information concerning physiological aspects of growth and development of the seeds obtained from different crosses useful crossability for analysis of interhybridization among diversified varieties.

7. Application

Gathering from research results, application could be compiled in supports of hybridization activities and *Hippeastrum* production management, in accordance with the research objectives in 7 categories as stated below:

7.1 Varietal identity through characterization

7.1.1 Extracting from characterization results, the most prominent identification of the variety for parent plants or hybrids alike is that of exine sculpture of the pollen.

7.1.2 Chromosome number and chromosome configuration could be useful for the breeders and variety releasers, in term of chromosomal identity. As in polyploid breeding, quite a number of large-flowered hybrids are triploid and anueploid derived from of tetraploid, for instance, the variety Red Lion, being an anueploid of 2n = 4x-1 = 43 (Vitayasak, 1996). Varieties such like this, being different in special manner, as anueploid, having less number of chromosome from the regular set. The monosome of *Hippeastrum* can easily be identified from its karyogram since metaphase chromosomes can simply be obtained from root tip squash technique developed from this study.

7.2 Estimation of parent varieties through anatomical structure

Anatomical structure such as epidermal texture, stomatal frequency, tissue systems of ground and vascular of certain organs can be used as estimating indices in terms of tolerance to environments, strength of internal supportive elements, conducting capacities of vascular tissues, relating to physiological phenomenon affecting growth and post-harvest quality of the parent plants. These aspects can be evaluated from transverse sections and epidermal peels prepared by the methods and special techniques simplified in this research, as proposed in the manuscript.

Remarks are made on the tissue structure of supportive organs the peduncles, of which are the part of the stem erecting the flowers. Parent varieties obtaining strong pedicels with less stomatal frequency should posses superior characters. The peduncle is also another important supportive organ, especially when it is hollow inside, thus have less area of parenchymatous tissue to provide turgidity.

Notes are also granted on the ground tissue system of the petals since it was observed from this study that the petals of *Hippeastrum* contain large air spaces giving small areas of water holding mesophyll to provide adequate turgidity to the petal tissue, even in the large-flowered tetraploid hybrids, let alone the thin cuticle layers above the epidermis.

Estimation of post-harvest properties belonging to various parent species can be carried out through the simple techniques of antomical studies. Estimating and justifying of the varieties prior to selecting of parent varieties could save the time, expenses and labour in conducting the hybridization while expectation of the hybrid characters could also be made.

7.3 Orientation and fertility of floral buds

It is notable that commercial tetraploid bulbs contain only 1 or 2 floral buds reflecting flowering capacity of the varieties. But, in diploid small-flowered bulbs a certain number of the floral bud appeared inside the bulb indicating better flowering capacity, reflecting more number of flower per plant available for pollination and fertilization.

As for growers who commercially produce small-flowered species/varieties, being aware of the nature of varieties, benefits can be made from the following

information. All of the floral buds oriented in those bulbs are fertile at the time of growing, as gathered from the study. Proper handling of the bulbs, avoiding drying out during dormant period should preserve those floral buds. With extra nutrient feed to these bulbs stimulation of small-sized floral buds could occur, giving more blooming inflorescences emerging from the bulb.

7.4 Germination tests and storage of pollens

As mentioned earlier, germinability of the pollens can be checked by simple methods with reliable accuracy. Pollination at proper time could thus be estimated from these tests. Pollen storage allows the breeders to work on hybridization of the parents having different blooming periods.

7.5 Embryo rescue of polyploid seeds

It is unfortunate that the experiment concerning embryo development of hybrid seeds was unsuccessful, otherwise useful information would be granted regarding to the matter. Nevertheless, practical improvement should be commenced to solve the technical problems.

Application approaches suggested above should literally indicate achievement in conducting the research on characters and floral development of diploid and tetraploid *Hippeastrum*. Nevertheless, further studies should be made from the basic information produced from this research to strengthen commercial production of *Hippeastrum*, benefitting the growers in the lowlands.