study were full strength MS (Murashige and Skoog, 1962) medium and ½ MS (both macro and micronutrients) medium. Media were supplemented with different concentrations (1.0 mgl^{-1} – 3.0 mgl^{-1}) of BAP and 2,4-D. Cultures were incubated under complete dark at 25±1°C in the growth room.

Study conducted by Haw and Keng (2003) on the same species produced multiple shoots from axillary bud explants without inducing callus in MS medium supplemented with 2.0 mgL^{-1} BAP. In the present study, callusing was observed within 5 days of incubation in full strength MS medium supplemented with BAP and 2,4D. It took longer period to initiate callus when both macro and micro nutrients in the basal medium was lowered to half and the amount of callus produced was also very low even after 6th week of incubation. In order to observe the time taken to produce maximum amount callus fresh weight was measured after 2nd, 4th and 6th week of incubation. It was observed that maximum amount of callus was produced within 4 weeks in all explant types tested with a maximum of 0.88 g ± 0.23 in leaf discs obtained from first fully opened leaf.

In order to determine the best growth regulator combination for callus initiation, calli fresh weights were measured after fourth week of incubation in different growth regulator combinations tested. Highest amount of calli were in MS medium in the presence of 2.25 mgl^{-1} BAP and 1.0 mgl^{-1} 2,4-D. Fragile calli, which were transulant and mucilaginous in nature were observed within 15 days of incubation, which could lead to cell suspension cultures.

041

Collection, conservation, evaluation and use of durian germplasm at Horana

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Unavailability of high quality varieties is one of the constraints in commercial durian production. A program to collect durian germplasm was initiated at Horana. Fruits from 26 seedling trees were evaluated for fruit weight, number of arils, number of seeds, weight of husk and seeds using six fruit per tree. Aril size, seed size, % rind, % seed and % aril were calculated. Aril color, flavor and overall acceptability were also recorded with a panel test. Results showed high variability in fruit quality traits exists among trees. Highest variability was found in number of seeds per fruit (CV=36.2%) while % rind showed the lowest variability (CV=7.26%). Number of seeds varied from 3.7 -19.2 per fruit while % rind varied from 60.5-79.5%. Nine accessions selected were planted with five replicates for further evaluation. Plant height and stem girth showed significant differences at early stages but became non significant by three years after planting. At 42 months after planting plant height varied from 368-492 cm while stem girth ranged from 42.0 - 52.8 cm. Principal component analysis of selected fruit and leaf characteristics of six accessions showed that first three PCs accounted for 89.35% of the variation in the characteristics used for the analysis indicating that the varieties of the collection are diverse. Collection of germplasm continued with establishment of a field gene bank to conserve accessions with two replicates. Nine selections were also further tested in farmer fields for adaptability.

042

In vitro propagation of *Kaempferia galanga* (L)

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Kaempferia galanga (L) is an aromatic perennial herb, which is widely used in Ayurvedic medicine. Dry tubers are imported in large scale to Sri Lanka due to lack of mass production in Sri Lanka. Disease susceptibility and higher cost of production have restricted its cultivation. Propagation of *Kaempferia galanga* is normally by rhizome cuttings but disease susceptibility of tender rhizomes restricts propagation in large scale. Propagation through other vegetative methods is not possible. Rahman *et al.* (2004) reported the possibility of obtaining plants through somatic embryogenesis but the survival rate was low. Therefore an attempt was made to develop a protocol for mass propagation of *Kaempferia galanga* through direct organogenesis.

Leaf discs and axillary buds were used as explants. Axillary buds isolated from rhizomes of *Kaempferia galanga* mother plants were sprayed with 0.2% Captan™ 2-3 days before collection. After that, they were placed on a wet paper lined tray and covered again with another wet paper. Five to six days later young axillary buds were emerged from nodes and they were used as explants. For leaf disc explants leaves were washed with soap and soaked in a solution of Teepol™ for 15 minutes, and washed with running tap water for 45 minutes.

Both leaf discs and axillury buds were dipped in 5% Chlorox™ (5.25% Sodium hyperclorite v/v) for 10-15 minutes under sterile conditions. Then they were washed 10% Clorox™ for 3 minutes and 70% ethanol for one minute each followed by two successive washings in sterile distilled water. Explants were cultured on MS basal medium (Murashige and Skoog, 1962) supplemented with different concentrations of Benzyl amino purine (BAP) and Indole acetic acid (IAA) (2.00 mgl^{-1} – 2.25 mgl^{-1} and 0.30 mgl^{-1} – 0.70 mgl^{-1} respectively). Sucrose 3% (w/v) and 0.8% agar were added to the media. pH was adjusted to 5.8.

Cultures were incubated under 16 hr light /8 hr dark at 26 ± 1 °C temperature for 21 days. Callusing was not observed from both tested explants in any of the media tested. After 15 –18 days of incubation axillary buds were elongated in all combinations tested. MS supplemented with 2.25 mgl^{-1} BAP and 0.5 mgl^{-1} IAA showed the highest elongation (490 ± 10 mm).

After 25-30 days of incubation *in vitro* grown shoots were cut and separated from the explant. Then they were subcultured on the same medium and incubated in 16 hr light at 26 ± 1 °C temperature for shoot multiplication. MS medium was used as basal medium with above combinations of growth regulators.

The highest multiplication was observed in 2.25 mgl^{-1} BAP and 0.5 mg^{-1} IAA (7.0 ±0.02) shoots per explant. Further sub culturing on to the same medium induced roots. Seven-weeks old plantlets were removed from culture vessels, washed well to remove all agar and transferred to small plastic pots containing sand, soil and compost in 1:1:1 proportion by volume and kept in shade house covered with polythene bags, for acclimatization. 100% survival was observed when acclimatized plants were transferred to the field.

043

Effect of physiological status on rooting of Masbedda (*Gymnema sylvestre*) cuttings

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Vegetative propagation by means of cuttings is an important method for starting new plants identical to the parent plants. Many plants can be propagated with good results by cutting, though the success depends upon the propagator's circumstances, the time of year, and the plant to be propagated. The present study was carried out to investigate the effect of physiological stage on rooting of *Gymnema sylvestre* stem cuttings.

Healthy, double nodded cuttings were made from the mature plant stock established at the Faculty of Agriculture, University of Ruhuna. The cuttings taken from pre-flowering (T1), flowering (T2) and post-flowering (T3) stages were stuck into preformed holes in poly bags filled with moistened rooting medium which consisted of sand, top soil and compost (1:1:1 by volume). They were placed in a shade house and watered once a day. The Completely Randomized Design (CRD) was used with ten replicates. Assessment was done 75 days after for rooting. The percentage survival was not significantly ($p \leq 0.05$) different between cuttings taken from the pre-flowering (92%) and post-flowering (87%) stages. No significant ($p \leq 0.05$) differences also in the percentage of callused and rooted cuttings were recorded between T1 and T3. However, number of roots and length of the longest root per cutting were significantly ($p \leq 0.05$) higher in T1 than any other. Furthermore, T2 showed the lowest figures for all the parameters assessed, indicating that the physiological status of the stock plant at the time the cuttings are excised is of great importance for the rooting process.