Studies on Nutrient Composition and Antioxidant of Philippine Indigenous Vegetables & *Moringa*

NUTRIENT COMPOSITION AND ANTIOXIDANT PROPERTY OF PHILIPPINE INDIGENOUS VEGETABLES

The present study has provided some comparative biochemical information on the proximate composition and gross anti-oxidant property of 20 indigenous vegetables. The results obtained from proximate analyses establish that they can be ranked as carbohydrate-rich vegetables due to their relatively high content (38 to 64%) when compared with the other components. The study concludes that most of the vegetables are important sources of proteins, fiber, minerals and fats. The vegetables contain an appreciable amount of calcium, phosphorous and iron to supplement our daily micronutrient needs.

The antioxidant property assay of the different indigenous vegetables at three preparations (raw, blanched, boiled) revealed that percent free radical scavenging activity and total phenolics of most vegetables are relatively high. The antioxidant activities of all raw leafy vegetables and okra (75.5 to 92%) are higher than those of the blanched (64 to 83.4%) and boiled (59 to 80.1%) counterparts. This indicates that blanching and boiling greatly influence the loss of antioxidant components in leafy vegetables. Blanching decreased the activity from 5 to 15% while boiling decreased the activity by 10 to 25%. Processing affects content, activity and bioavailability of bioactive compounds and therefore health promoting capacity of vegetables depends on their processing history. This aspect should be strictly considered to obtain the optimum nutriceutical benefits from vegetables.

Over-all, there are indications that most of the indigenous vegetables studied are good sources of nutrients and antioxidants at varying degree. Therefore, the choice depends on the individual as they are potential sources of food that are suitable for fortification and their use as nutritional supplements is highly promising. The wide variation in color, tastes and textures of various vegetables can add an interesting touch to Filipino meals. Indigenous vegetables can contribute significantly to the nutrient requirements of humans and should be strongly recommended for inclusion in our meals/diet.

Further studies involving identification and quantification of specific antioxidants (carotenes, ascorbic acids, tocopherols, flavonoids and other phytochemicals) are recommended.

Likewise, the findings on the nutritional importance of these indigenous vegetables to humans should provide a motivation for exploring their horticultural potential.

Source: Nutrient Composition and Antioxidant Property of Philippine Indigenous Vegetables by Ilda G. Borlongan (completed October 2013)

ADAPTABILITY AND HORTICULTURAL CHARACTERIZATION OF DIFFERENT *MORINGA* ACCESSIONS UNDER LOCAL CONDITIONS

Eighteen *Moringa* accessions from the AVRDC-The World Vegetable Center germplasm collections were evaluated in observational trials to determine the (1) percentage germination and survival of the *Moringa* accessions under CPU conditions, (2) their horticultural characteristics, (3) their susceptibility to insect pests and/or diseases, and (4) their coppicing capacity. The accessions originated from India (3), Laos (1), Taiwan (1), Tanzania (1), Thailand (10), and USA (1).

Results revealed that seedlings started to emerge 6.3 to 10.6 days after sowing with Mo-34 from India having the earliest and Mo-40 also from India having the latest. Germination percentage ranged from 40 to 100% with eight accessions having 100% and two accessions having 40%. Survival ranged from 75 to 100%.

As to plant height, Mo-34 (India) emerged as the tallest with Mo-9 (Thailand) the shortest plants 6 weeks after planting (WAP). At 19 weeks after first pruning (WA1Pr), Mo-35 (Tanzania) was the tallest while Mo-15 (Thailand) 6 weeks after planting (WAP). At 19 weeks after first pruning (WA1Pr), Mo-35 (Tanzania) was the tallest while Mo-15 (Thailand) was the shortest. At 28 weeks after second pruning, Mo-2 (USA) and Mo-12 (Thailand) were the tallest and shortest, respectively. Mean stem diameter ranged from 3.5 cm (Mo-34) to 8.5 cm (Mo-4, Thailand). Mo-38 (Thailand) had the best coppicing capacity or the most branches (5.2) while Mo-33 (Philippines) had the poorest coppicing capacity or the least branches per plant. Mo-4 and Mo-14, both from Thailand, produced the highest leaf fresh weight exceeding 2 kg/plant from one pruning. Eight accessions yielded leaf fresh biomass exceeding kg/plant having yield potential of 3 to 7.8 t/ha of fresh leaf biomass. In terms of dry matter, Mo-6 (Thailand) and Mo-2 ranked first and second at 33.6% and 33.8%, respectively.

Among the 18 *Moringa oleifera* accessions, only 11 developed flowers which started to appear 49 to 93 days after transplanting (DAT). Of these 11 accessions, only 9 produced pods which started to appear 75 to 182 DAT. Mo-4 and Mo-20 (both from Thailand) did not produce any pod.

One year after planting, only seven accessions (Mo-2, Mo-3, Mo-7, Mo-29, Mo-34, Mo-35, and Mo-37 developed pods and seeds. Of these, Mo-3 produced the most pods per tree while Mo-34 produced the most seeds which can be explained by its longer pods which subsequently resulted in more seeds in spite of its lesser number of pods per tree.

Three years after planting, all the accessions with the exception of Mo-4 and Mo-6, developed flowers, pods, and seeds. Mo-38 produced the highest average number of seeds per pod while Mo-15 developed the most number of pods and seeds per tree. Throughout the study, only red mites, coccinelid beetle, defoliator, leaf-footed bugs, and white flies were present but these caused only minor damage to the plants. Stem rot was the only pathogenic disease observed from a few plants.

This preliminary evaluation trial suggests that there are promising *Moringa* accessions adapted for local conditions with potential for high leaf biomass and seed production. Accessions from Thailand, India and USA possess desirable horticultural traits such as leaf fresh weight (Mo-4 and Mo-14), stem diameter (Mo-4, Mo-2 and Mo-40) and number of side branches (Mo-38, Mo-9 and Mo-40). Three accessions from Thailand (Mo-15, Mo-7 and Mo-9) and one from India (Mo-34) are ideal for seed production.

Based on the findings and conclusions of the study, it is recommended that: 1) accessions with desirable leaf fresh weight (Mo-4 and Mo-14), dry matter weight (Mo-2 and Mo-6), stem diameter (Mo-4, Mo-2 and Mo-40), coppicing capacity (Mo-38, Mo-9 and Mo-40) and seed production (Mo-15, Mo-7, Mo-9 and Mo-34) should be propagated for commercial production; 2) data on leaf yield and number of branches should be obtained at the same time to check if there is a significant positive correlation between these two parameters; 3) the number of seeds/pod should be correlated with number of seeds/tree and the number of pods/tree with number of seeds/tree to determine in which accession is there a higher positive correlation between seed yield/tree and the two seed yield components; and, 4) the results of this observational trial be validated using a replicated field trial when sufficient amount of seeds are available.

Source: Adaptability and Horticultural Characterization of Different Moringa Accessions Under Local Conditions by Hope G. Patricio (completed August 2013)

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