DRY MATTER PRODUCTION OF FIVE VALANGUR (POLYSCIAS SP.) VARIETIES

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ABSTRACT

Five Valangur varieties namely Tuna, Kiau, Ene, Molo and Ravalian were collected and established at the University of Vudal farm in the East New Britain Province.

As part of a series of studies planned for the Valangur Varieties Collection Project, a dry matter production study was conducted from March to June 2008 to find out which of the five varieties produces consistent higher dry matter yields (DMY).

The study shows that the Valangur variety Ene gave higher dry matter yields throughout the 4 months period. This result is consistent with the physical leaf characteristics of this particular variety. The DMY for the other four varieties (Tuna, Kiau, Molo and Ravalian) were similar and not significantly different.

Keywords: *Five Valangur varieties, studies, Collectiion Project, matter yields, leaf, characteristics.*

INTRODUCTION

Papua New Guinea (PNG) is blessed with extensive renewable and non-renewable natural resources, a generally favorable climate, and a relatively small population of about 5.4 million. The forests in particular have provided Papua New Guineans with building and clothing materials, spiritual purposes and food resources since time immemorial. There is a plethora of diverse plant species which are used for medicinal purposes and as green vegetables that continue to play a major role in the nutrition and health, and livelihood of many communities.

In spite of this floral diversity, there is unfortunately scant information about their biological characteristics, nutritional and other uses as well as information on their negative aspects. This lack of information and documentation has led to a situation where some of these plant species especially the green leafy vegetables have been "neglected" and sadly to say have been given less priority in terms of research and their cultivation compared to many introduced vegetable plant species.

One of these plant species which continue to contribute to the nutrition and well-being of the people of East New Britain Province is a shrub called "Valangur" in the Kuanua language of the Tolai people of East New Britain Province (ENBP). Valangur (Polyscias spp.) is used extensively in the Gazelle Peninsula as a live fence, as an erosion control plant and as a vegetable crop. A survey conducted by Lolo (1982), indicated that Valangur (Polyscias verticillata) is one of the most frequently consumed green vegetables among the Tolai people of ENBP.

Conn (1995), indicated that there are about 100 species of Polyscias throughout the tropics including the Pacific Islands and 20 of them are found in Papuasia region. Moreover, 9 of the species are considered endemic and only 3 of them are known to be in cultivation. In PNG, Conn (1995) documented the characteristics of 19 Polyscias species. However, there is very little information available on the nutritional and other social beneficial attributes of these species.

This report highlights the dry matter production of five Valangur varieties as part of a series of studies planned for the Valangur Varieties Collection Project (Project No: 10107) established at the University of Vudal (UOV) in East New Britain Province.

MATERIALS AND METHODS

Location

The Valangur Varieties Collection Project was established at the UOV's agriculture farm located

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within the university campus. The university is situated approximately 45 km away from Rabaul town in ENBP. The geographical coordinates are 155° east and 10° south of the equator. The annual rainfall is about 3000 mm and the mean monthly minimum and maximum temperatures range from 22-25°C and 30-33°C, respectively.

Varieties and spacing

Five Valangur varieties were used and are known locally as Valangur Tuna, Valangur Kiau, Valangur Ene, Valangur Molo and Valangur Ravalian. The total area used for the project was 529 m^2 and the spacing within and between rows, within a variety, were 200 cm and 150 cm, respectively. The spacing between varieties was 200 cm. Therefore, there were 3 rows per variety.

Stem cuttings (with variable lengths and sizes) were used as planting materials and the number of cuttings per variety was 33 which required a total of 165 cuttings.

Leaf sampling procedure for dry matter determination

The first leaf sampling for DMY was conducted in March 2008 and continued at monthly intervals for 4 months. Leaf samples were collected from 5 random selected plants from each variety and this was done by harvesting the 3rd and 4th imparipinnate leaves from the top. Subsequent leaf samplings were done on the same plants within the 4 months period. Immediately, after the leaves were harvested, their fresh weights (FW) were taken and then dried in an oven at 80°C for 24 hours and after cooling, their dry weights were taken.

RESULTS AND DISCUSSION

The dry matter yield data indicate that there were significant ($P<0.05$) differences in dry matter yields between varieties Ene and Tuna, between Ene and Kiau, between Ene and Molo, and between Ene and Ravalian (Figure 1). No significant ($P<0.05$) differences in dry matter yields were observed among varieties Tuna, Kiau, Molo and Ravalian.

It is apparent from the results that in terms of dry matter production, variety Ene consistently produced higher dry matter yields compared to the other four varieties. This result is consistent with the physical characteristics of this variety particularly in relation to its leaf characteristics. For example, the number of leaflets and petiole lengths of variety Ene are 13 and 52.5 cm, respectively. Also, the width range of leaflets and the average length of leaflets of variety Ene are slightly higher compared to the other four varieties (Table 1 and Plate 3) which have less number of leaflets and shorter petiole lengths (Table 3 and Plates 1, 2, 4 and 5). However, it is quite evident that the higher number of leaflets, the longer

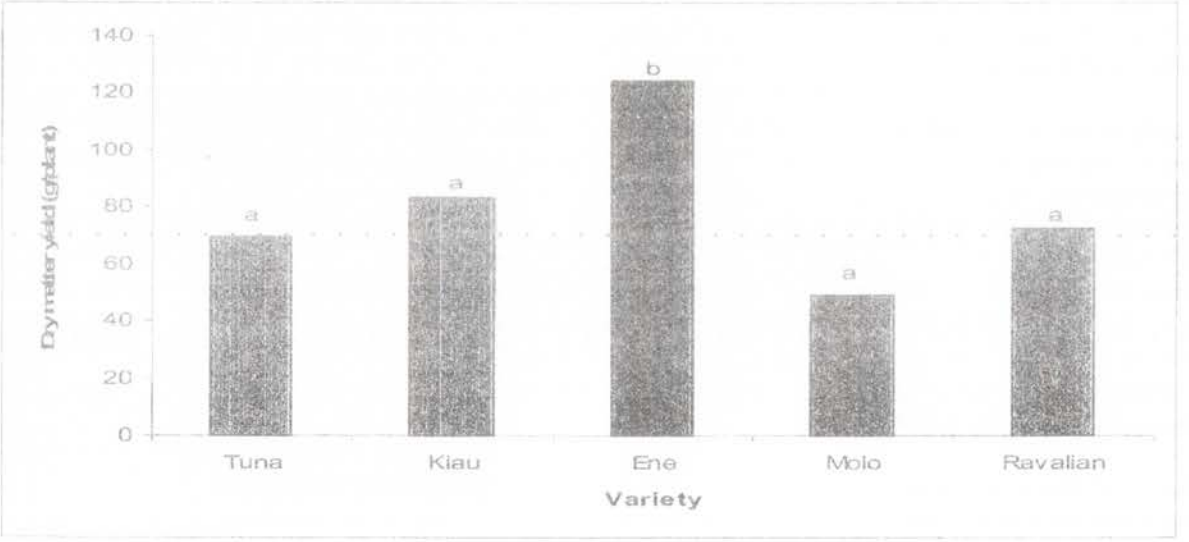

Figure 1. **Dry matter yields of the five varieties of Valangur. Columns headed by the same letter do not differ significantly at the 5% level by DMRT.**

Table 1. Some leaf characteristics of the different Valangur varieties

Characteristic	Variety				
	Tuna	Kiau	Ene	Molo	Ravalian
Number of leaflets	11	9	13	11	11
Average length of leaflets (cm)	15 cm (range: 11-16.5 cm)	17.8 cm (range: 12.9-19.4 cm)	23.3 cm (range. 17-26.5 cm)	22.3 cm (range: 17-27 cm)	17.4 cm (range: 14-21 cm)
Width range of leaflets (cm)	7-10 cm	7-9.5 cm	7.5-12 cm	7.5-10 cm	6.5-10 cm
Petiole length (cm)	36 cm	33.5 cm	52.5 cm	46 cm	38.5 cm
Color	Yellowish at top & green at lower leaves	Yellowish top leaves and green at lower leaves	Glossy dark green	Glossy dark green	Dark green

Plate 1. Valangur Tuna

Plate 2. Valangur Kiau

Plate 3. Valangur Ene

Plate 4. Valangur Molo

Plate 5. Valangur Ravalian

leaflets and the petiole length appear to be the major contributing factors to the higher dry matter yields observed in variety Valangur Ene.

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