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Some studies on

Nutritional value & L-DOPA content

of

Mucuna utilis

The Undergraduate Project by

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Abstract

The experimental study was carried out on the nutritional value and L-DOPA content of legume seeds; *Mucuna utilis* mainly, because it was thought that this seed contributes to longevity, less cardiovascular and neuropathies exhibited by some populations. It was hypothesized that this was due to some biologically active compounds in the processed seed these populations eat.

The soluble (4.85%, 5.35%, & 4.04%), insoluble (28.83%, 24.19%, & 27.27%) and total (33.68%, 29.54%, & 31.31%) dietary fibre content of *M. utilis*, *M. atterrima*, and *M. derringiana* was carried out using an enzymatic method, showed that all 3 species rich in fibres.

The digestible carbohydrates were assessed by Nelson method, after the enzymatic digestion of starch in *M. utilis*, *M. atterrima* & *M. derringiana* seeds. This showed that all 3 species could be used as good energy supplements. They had digestible carbohydrates of 30.79% (± 0.02), 25.34% (± 0.002), and 23.98% (± 0.006), respectively.

The moisture contents of the 3 species determined by oven drying were, 11.5%, 11.8%, and 11.7%, respectively. Considering the high content of protein (approximately 20%), it was clear that this legume could have good nutritional value.

The *Mucuna* spp. are famous for its L-DOPA and THIQ contents. The L-DOPA content was determined by a newly developed extraction technique in the study, followed by HPTLC using cellulose plates with n-butanol (7) acetone (7) water (4) glacial acetic acid (2) as the solvent system. By this method, the L-DOPA content was 3.12%, 3.19%, & 2.78 respectively. By a previously used UV absorbance method, 6.20%, 6.73%, & 5.20% of L-DOPA respectively attained, which over-estimated the L-DOPA in the seeds.

The contents of THIQ in the seeds could not be detected, due to its low concentration, and the non-availability of the matching standard (H-THIQ).

Further studies on the effects of processing on L-DOPA content of *M. utilis* seeds showed that it had elevated by 15.4% after soaking of the dry seed (24h), but reduced by 54.2% after boiling the soaked seeds (40 mins). This was an indicator of deterioration of toxicity, which made the seed more favourable for consumption by human beings.

When fed with diets substituted with 5% & 10% of *M. utilis* dry seed powder for 4 weeks, male ICR mice did not show any visible behavioural changes, despite the ingestion of high doses (7 to 13 mg mouse⁻¹ day⁻¹) of L-DOPA in the seed, therefore the suspicion arose regarding the counterbalancing activities of other natural biologically active substances present in the seed. This can also make it possible to use this seed as a safe nutritious feed. The nutritional value of *M. utilis* was indicated, when mice in the 5% and 10% test groups had a weight gain comparable to the control group. Their food intake was also comparable.

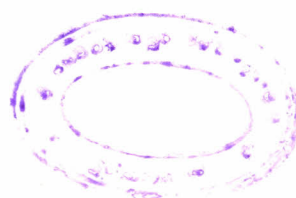
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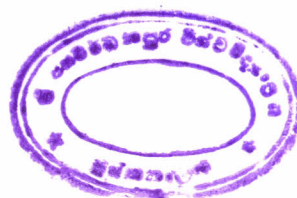
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