A Review on *Melocanna Baccifera*

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ABSTRACT: Young edible bamboo shoot (*Muia* in Kokborok-the third Official Language of Tripura, India) of *Melocanna baccifera* is widely used as a raw food ingredient of different dishes of Tribal of Tripura. Methanolic extract of *Melocanna baccifera* (MEMB) revealed the presence of different bioactive constituents like alkaloids, fixed oil, flavonoids, triterpinoids, glycosides carbohydrate, protein, and minerals like sodium, potassium, calcium, chloride, phosphate. Few pharmacological actions such as analgesic activity, antidiabetic activity and hepatoprotective activity along with antimicrobial activity also exhibited by methanolic extract of *Melocanna baccifera*. The extract also exhibited CNS depressant activity.

KEYWORDS: *Melocanna baccifera*, *Muia*, *Chakhwi*, pharmacological actions.

INTRODUCTION

The edible young bamboo shoot that has just arisen from the soil is used as a food ingredient specially by Tribal people of Tripura.

In Kokborok, such shoot is called *Muia* (3rd official language of Tripura). These are usually 20 to 30cm long. In the rainy season, the bamboo shoots begin to emerge from the root of mature bamboos. The shoots remain covered by curvaceous sheaths. These sheaths fall off as the shoots grow mature & larger. These are edible & soft when are of about 20 -25 inches in height. During this stage, the food values specially the protein contents remain peak. *Muia* varies in weight, size & bitterness. These are very popular food ingredient not only to the Tribal of Tripura, but also to the other people of North- Eastern region. From the ancient time

different literature explained the uses of *Muia* both as food as well as medicine. It is the young edible bamboo shoot. Removing the outer shell & internodes they take this *Muia* as vegetables. They prepare many more dishes mixing with *Muia* such as Godok, Berma bwtwi, Mui borok, Mui awandru (Kokborok term) etc from various types of bamboo shoot [1,2,3,4,5].

According to the Tribal people of Tripura, the *Muia* of *Melocanna baccifera* is very much tasty among the different types of edible *Muia*. In Bengali, it is known as Muli bash. It contains thin wall, diameter is small. It flowers at the intervals of 40 to 44 years [6]. It belongs to family poaceae, synonymes *Bambusa baccifera* (Roxb) [7,8]

Food Values

Methanolic extract of edible shoot MB revealed the presence of carbohydrate, fat, protein, vit. C, tannin, alkaloid, fixed oil, glycosides, triterpinoids, flavonoids, chloride, phosphate, calcium, magnesium, copper, sodium, phosphorous, potassium and nitrate [9,10].

Antimicrobial Activity

Quantitative efficacy of plant extract was determined and estimated as Minimum Inhibitory Concentration (MIC) against different test microbial/bacterial pathogens. It was observed that MICs of tetracycline ranged from 15.625 to 31.25µg/ml where the MICs of *Muia* were same (125µg/ml) against CD, EA, BP, SA, BS & KP. The MIC analysis of the test sample in the present study was also compared with standard/ commercial/known drug (Tetracycline) collected from RIPSAT, Agartala. It was noted that Tetracycline showed superior efficacy in terms of MICs as per the finding of the present study. Antimicrobial activity of tetracycline was extremely significant (p<0.001) when distinguished with *Muia*.

Muia extract of *M. baccifera* have shown highest antibacterial effect against *Staphylococcus aureus* (12.3±0.6)-a Gram +ve

bacterium. The *Muia* also showed the same zone of inhibition against *Corynebacterium diphtheriae* (Gram+ve bacterium) and *Bordetella pertussis* (Gram –ve bacterium) (11 ± 0.8 and 11 ± 0.6 respectively). From the experiment, it is observed all the tested bacteria inhibited with lower concentration of plant extract of *Muia* [9].

[CD-*Corynebacterium diphtheriae*, EA- *Enterobacter aerogenes*, BP-*Bordetella pertussis* SA-*Staphylococcus aureus*, BS- *Bacillus subtilis* and KP- *Klebsiella pneumoniae*.]

Analgesic activity

The Analgesic activity was studied using acetic acid (3% aqueous acetic acid 2ml/kgbw, i.p) induced writhing model on mice. In the acetic acid induced writhing study showed that the treatment of MEMB (*Muia*) (40.66 ± 1.647) at the dose of 150 mg/kgbw (orally) have significant ($***p < 0.001$) analgesic effects in the animals under investigation in comparison to acetic acid (76.33 ± 5.194) treated control animals. The results of Aspirin (19.33 ± 2.171) treated (Standard drug) animals were also significant ($***p < 0.001$) in comparative to acetic acid treated control animals and Aspirin exhibited comparatively more analgesic effect than *Muia*. On calculating the percent of protection of *Muia*, it was found 46.73%. [10].

CNS Depressant Activity

The central nervous system (CNS) depressant property of MEMB was studied using locomotor activity of mice in actophotometer. The locomotor behavioural score of individual animals were recorded for the period of 10 minutes. In the locomotor behavioural study showed that the treatment of *Muia* (286.17 ± 29.333) at the dose of 150 mg/kgbw (orally) have significant ($***p < 0.001$) CNS depressant effects in the animals under investigation in comparison to vehicle treated (566.17 ± 16.964) normal control animals [11]. The results of Diazepam (19.33 ± 2.171) treated (Standard drug at the dose 4mg/kgbw, i.p) animals were also significant ($***p < 0.001$) in comparison to vehicle treated normal control animals and Diazepam exhibited comparatively more CNS depressant effect than *Muia*.

Hepatoprotective activity

The hepatoprotective activity was performed in CCl₄ (subcutaneous injection) induced animals (mice) for seven days where CCl₄ have significantly enhanced the levels of SGPT ($C***p < 0.001$), SGOT ($C***p < 0.001$), Total Bilirubin ($C***p < 0.001$) and Direct Bilirubin ($C*p < 0.05$) of toxic control group of animals in comparison to normal control group of animals. The MEMB ($***p < 0.001$) at the dose of 150 mg/kgbw (oral administration) significantly reduces the CCl₄ induced elevated SGOT level in the animals under investigation compared to toxic control group of animals. Whereas, MEMB reduced CCl₄ induced elevated SGPT, total and direct bilirubin levels of animals non- significantly ($p > 0.05$) compared to toxic control group of animals. Treatment with Liv-52 (50 mg/kgbw, p.o) has significantly ($***p < 0.001$) brought down the elevated levels of SGPT, SGOT, total and direct bilirubin levels of animals in compared to toxic control group of animals.

Histopathological section of MEMB has shown the central vein, liver sinusoid, liver chord with few damaged parenchyma after treatment with *Muia*. The section also exhibited minimum degree of damage and better recovery which are in good agreement with the test results of SGPT, SGOT, TB & DB.

They have stated that *Muia* (MEMB) recovered the injured liver significantly by decreasing the level of SGOT & non significantly by decreasing SGPT & direct bilirubin [12].

Antidiabetic Activity

Uma *et al.*, (2019) had evaluated the antidiabetic activity of *Muia* (MEMB). The antidiabetic study was carried out by using Streptozotocin (STZ at the dose 65 mg/kgbw, i.p) induced diabetic model on rats (wistar rats). A significant ($C***p < 0.001$) rise in blood glucose level were observed in animals of diabetic control group on 1st (48 hours after STZ injection), 7th (9th day after STZ injection) and 14th (16th day after STZ injection) day of treatment in compared to normal control group of animals. The *Muia* ($***p < 0.001$) treatment at the dose of 150 mg/kgbw (oral administration) significantly reduces the STZ induced elevated glucose level on 14th day of treatment in the animals under investigation compared to diabetic control group of animals.

Whereas, *Muia* non-significantly ($p>0.05$) reduced STZ induced elevated glucose level on 7th day of treatment in same animals compared to diabetic control group of animals.

An increase in body weight during treatment for diabetes is a positive indication for the effectiveness of treatment. The body weight of diabetic control group of animals was reduced on 7th and 14th day of treatment compared to normal control group of animals. Results showed less reduction in body weight in *Muia* treated groups of animals compared to diabetic control group of animals. However, STZ induced body weight reduction in animals under investigation and induced recovery of STZ induced weight loss by *Muia* was statistically non-significant ($p>0.05$).

A significant rise in liver function parameters [Cholesterol ($C^{***}p<0.001$) & Triglyceride ($C^{***}p<0.001$)] was observed in diabetic control group of animals after 16 days of STZ injection in compared to normal control group of animals. The *Muia* treatment at the dose of 150 mg/kgbw significantly reduced the STZ induced elevated Cholesterol ($^{***}p<0.001$) & Triglyceride ($^{**}p<0.01$) level in the animals under investigation compared to diabetic control group of animals. The *Muia* treatment at the dose of 150 mg/kg bw non-significantly ($p>0.05$) reduced the STZ induced elevated Urea & Creatinine in the animals under investigation compared to diabetic control group of animals. The above observation indicated that *Muia* may have liver protective potential in diabetic condition [13].

CONCLUSION

Methanol extract of *Muia* revealed the presence of some phytoconstituents along with nutritional values. MB extract exhibited the antibacterial activity against the growth of the selected pathogenic bacteria. The therapeutic activity such as analgesic activity, CNS depressant activity, hepatoprotective activity and antidiabetic activity of *Muia* might be linked with the presence of alkaloids, triterpinoids, flavonoids, tannins, glycosides, fixed oils, minerals and other bioactive components of the plants. Further intensive studies may highlight the exact mechanism of action of the phytoconstituents.

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