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Amina Ferdous Chowdhury
Department of Pharmacy, BRAC University, Dhaka, Bangladesh

Nura Ahmed
Department of Pharmacy, BRAC University, Dhaka, Bangladesh

Rafiqul Hasan Khan
Department of Pharmacy, BRAC University, Dhaka, Bangladesh

Shakera Islam Keya
Department of Pharmacy, BRAC University, Dhaka, Bangladesh

Mahbuba Mohoshina Runa
Department of Pharmacy, BRAC University, Dhaka, Bangladesh

Monika Nasrin Munni
Department of Pharmacy, BRAC University, Dhaka, Bangladesh

Kazi Nuruddin Al Masud
Department of Pharmacy, BRAC University, Dhaka, Bangladesh

Correspondence
Kazi Nuruddin Al Masud
Department of Pharmacy, BRAC University, Dhaka, Bangladesh

Phytochemical screening of *Boeica filiformis*

Amina Ferdous Chowdhury, Nura Ahmed, Rafiqul Hasan Khan, Shakera Islam Keya, Mahbuba Mohoshina Runa, Monika Nasrin Munni and Kazi Nuruddin Al Masud

Abstract
This study was conducted to perform the phytochemical screening of *Boeica filiformis* (Roxb.). The plant belongs to the Gesneriaceae family and locally used analgesic agent. This study provides a scientific basis for the use of *Boeica filiformis* in traditional medicine. The plant was extracted using Ethanol. The extract was subjected to phytochemical screening. The phytochemical screening of *Boeica filiformis* seeds showed the presence of alkaloids, flavonoids, tannins, phenol, phlobatannin, quinones, sterol and tannins but showed absence of glycosides and resin.

Keywords: Methanol, *Boeica filiformis*, phytochemical screening

Introduction
Medicinal plants are an integral part of traditional medicines. Traditional drugs are a collection of knowledge, practices and techniques. Indeed, the beliefs of indigenous people in theory, experience, and diverse cultures, as well as being able to explain it, can be used not only to maintain health, but also to diagnose, prevent different diseases. Traditional medicines use parts like leafs or roots to treat different diseases. Nature is the basic source of 87% of drugs used to treat all type of human diseases. About 25% of recommended drugs made from the plant. In developing countries, around 80% people depend on traditional based medications for their wellbeing [1]. In this project, I have focused on traditional plants used in Bangladesh to discover some unknown pharmacological effect of those plants like antioxidant, antimicrobial and cytotoxicity to discover a new source of drugs to treat diseases efficiently and cost effectively. Phytochemical investigations have been run on 15% medicinal plants [2]. Based on the several activities provided by the other species of *Boeica* genus, *Boeica filiformis* plant has been chosen to perform the phytochemical screening.

Materials and Methods
Plant collection and identification
The seeds of *Boeica filiformis* was collected in the month of October 2017 from Kumilla, Bangladesh. After that, its verification (Verification code number: 42929) was done by the National Herbarium of Bangladesh (NHB), Mirpur, Dhaka by submitting plant sample.

Chemicals:
Potassium mercuric iodide, Iodine in potassium iodide, Dragendorff's reagent, Saturated picric acid, Tannic acid, Neutral ferric chloride, Sodium nitroprusside, Glacial acetic acid, Concentrated H_2SO_4, Molish's reagents, $CuSO_4$, Alcoholic KOH, Basic lead acetate, Acetic anhydride, NaOH, Chloroform, $NaNO_2$, Methanol, Folin-Ciocalteu reagent, Na_2CO_3 were used.

Preparation of plant extract
After the washing the leaves with clean water the leaves were shade dried for several days and were grounded finely as a granular particle with a high power grinding machine. About 400gm of grounded leave powder of *Boeica filiformis* which was drenched in 2L of ethanol for 14 days period in a room temperature (22-25 ^oC) with random agitation. After 14 days of soaking, the substances of the bottle were emptied out first to filter them by using Whatman filter paper (pore size 100nm). The filtrate was concentrated by using rotary evaporator (Heidolph) at 30 ^oC temperature with a rotation speed of 100rpm up to form the concentrated ethanolic extract.

Phytochemical screening
The crude extract of *Boeica filiformis* was used for phytochemical screening to identify its chemical compound present in its leaves.

Procedure of extract preparation for screening:
2-3 grams of dried ethanol extract was mixed with 50ml ethanol in a 100ml of conical flask. After that, that flask was labeled properly closing with cotton plugs and kept still for 1 to 2 hours. Later, the mixture was filtered through Whatman filter paper. Collected filtrates were used for phytochemical screening by following the standard process [6, 7]. The following qualitative tests were performed sequentially:

Tests for Alkaloids
Mayer's test: A few drops of Mayer's reagent (Potassium mercuric iodide solution) was added in 1ml of seed extract. If cream color precipitation form then it will contain the presence of alkaloids.

Wagner's test: In 1ml of seed extract was added with the same amount of Wagner's reagent (Iodine in potassium iodide). If reddish brown color precipitation form then it will point to the presence of alkaloids.

Dragendorff's reagent test: 2ml of Dragendorff's reagent was added in 1ml of seed extract and later dilute HCL of 2ml was added in that solution. If orange color precipitation forms then it will confirm the presence of alkaloids.

Hager's test: A few drops of Hager's reagent (Saturated picric acid solution) was added in 2ml of seed extract. If bright yellow color precipitation form then it will point to the presence of alkaloids.

Tannic acid test: A few drops of tannic acids was added in 1ml of seed extract. If yellow-brown colored precipitation form then it will point to the presence of alkaloids.

$FeCl_3$ test: About 1-2 ml extract was mixed with a little amount of neutral ferric chloride solution in dropwise. If cream yellow precipitation forms then it will point to the presence of alkaloids.

Tests for glycosides
Legal's Test: Addition of alkaline sodium nitroprusside and pyridine in extract solution results in the formation of cherry red color then it will confirm to the presence of glycosides.

Keller Killiani test: At first 1ml of glacial acetic acid was mixed-up with 1 ml of extract and cooled. After that 2-3 drops of ferric chloride was mixed and 2ml of concentrated H_2SO_4 was added carefully in sideways of test tube walls. If reddish brown colored ring at the junction of two layers form then it will point to the presence of glycosides.

Concentrated H_2SO_4 test: 1ml of Concentrated H_2SO_4 was added in 1ml of seed extract and kept still for 2 minutes. If reddish color precipitate form then it will point to the presence of glycosides.

Molish's test: In seed extract around 2-3 drops of Molish's reagents was added. Later, a few drops of concentrated H_2SO_4 was added properly. If reddish purple colored ring at the junction of two layers form then it will point to the presence of glycosides.

Test for phlobatannins: At first 2-3ml of 10% HCl was added in 10ml of seed extract in a boiling test tube which was boiled for 5-6 minutes. If red color precipitate occurs then it will point to the presence of phlobatannins.

Test for resins: 3-4ml of the $CuSO_4$ solution was mixed-up with seed extract which was shaken vigorously for 1-2 minutes and allowed to discrete. If green color precipitate occurs then it will point to the presence of resins.

Test for quinones: Alcoholic KOH solution was added in seed extract. If color ranging from red to blue occur then it will point to the presence of quinones.

Test for Saponins: In the test tube 5ml of the extract was taken and shaked vigorously to get a stable froth. 5-6 drops of olive oil were added into frothing solution. If the emulsion is formed then it will point to the presence of saponins.

Tests for phenols
Ellagic acid test: A few drops of 5% (w/v) glacial acetic acid was added in seed extract. After that 5% (w/v) $NaNO_2$ solution was added. If muddy brown color form then it will point to the presence of phenols.

Phenol test: 1ml of the $FeCl_3$ solution was added in 2ml of seed extract. If the development of intense color form then it will point to the presence of phenols.

Tests for Tannins
Ferric chloride test: A few drops of $FeCl_3$ was added in seed extract. If blackish color precipitate form then it will point to the presence of tannins.

Lead acetate test: A few drops of basic lead acetate was added in 1-2ml of seed extract. If bulky red color precipitate form then it will point to the presence of tannins.

Alkaline reagent test: A few drops of sodium hydroxide solution was added in seed extract. If red color form then it will point to the presence of tannins.

Tests for flavonoids
Lead-acetate test: A few drops of basic lead acetate solution was added in 1-2ml of seed extract. If reddish brown color precipitate form then it will point to the presence of flavonoids.

$FeCl_3$ test: A few drops of neutral ferric chloride solution was added in 1-2ml of seed extract. If the deposition of blackish red color precipitate form then it will point to the presence of flavonoids.

Alkaline reagent test: A few drops of sodium hydroxide was added in 1-2ml of seed extract. If yellowish red color occurs then it will point to the presence of flavonoids.

Test for sterols
Libermann-Burchard test: A few drops of acetic anhydride solution was mixed with 1-2ml of seed extract. After that, a few drops of concentrated H_2SO_4 was given beside the test tube walls in the mixture. If reddish brown color ring at the junction of two layers occur then it will point to the presence of sterols.

Salkowski test: 5ml of chloroform was added in 1-2ml of seed extract. After that, 1ml of concentrated H_2SO_4 was put beside the test tube walls. If the reddish color in the lower layer occurs then it will point to the presence of sterols.

Result and Discussion

Phytochemical screening

Table 1: Phytochemical screening of *Boeica filiformis* seed

Serial Number	Class of compound	Result
1	Alkaloid	++++
2	Glycoside	-
3	Phlobatannin	++
4	Resin	-
5	Quinone	+++
6	Phenol	+
7	Tannnin	+
8	Flavonoids	+
9	Sterol	+++++

Note: (+) = presence in a single method test, (++) = presence experimented in two methods, (+++) = presence experimented in three methods, (++++) = presence experimented in four methods, (+++++) = presence experimented in five methods and (-) = absence.

Discussion

The phytochemical screening of *Boeica filiformis* showed the presence of alkaloids, flavonoids, phenol, phlobatannin, sterol and tannins whereas showing the absence of glycosides and resin.

Conclusion

The phytochemical analysis showed the presence of several phytochemicals which can be further isolated using compound isolation. The Phytochemical analysis showed *Boeica filiformis* has different phytochemicals which can be isolated and study in the further experiments.

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