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Citations (4) Figures (5)

Abstract and Figures

This study evaluated the phytochemical profile of the bark and leaf extracts (aqueous, ethanol, and hexane) of Jacquemontia paniculata (Convolvulaceae). Qualitative tests for alkaloids, saponins, tannins/polyphenols, steroids, tannins, anthraquinones, cyanogenic glycocides, and flavonoids were conducted. Further quantification of flavonoids using the Quercitin acid equivalence was employed in all extracts. Overall, alkaloids, flavonoids, saponins, steroids, tannins, and anthraquinones were found to be present in most of the extracts. The total flavonoids varied from 12.81 to 15.51mg/g in extracts. The maximum flavonoid content was found in the ethanolic bark extract (15.51mg/g) while the lowest flavonoid content was found in hexane leaf extract (12.81mg/g). Present findings were preliminary and further investigation is needed to determine the pharmacological applications of the plant.

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Phytochemical profile of bark and leaf extracts of *Jacquemontia paniculata* (Convolvulaceae)

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Key words: *Jacquemontia paniculata*, Extracts, Phytochemical

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Abstract

This study evaluated the phytochemical profile of the bark and leaf extracts (aqueous, ethanol, and hexane) of *Jacquemontia paniculata* (Convolvulaceae). Qualitative tests for alkaloids, saponins, tannins/polyphenols, steroids, tannins, anthraquinones, cyanogenic glycocides, and flavonoids were conducted. Further quantification of flavonoids using the Quercitin acid equivalence was employed in all extracts. Overall, alkaloids, flavonoids, saponins, steroids, tannins, and anthraquinones were found to be present in most of the extracts. The total flavonoids varied from 12.81 to 15.51mg/g in extracts. The maximum flavonoid content was found in the ethanolic bark extract (15.51mg/g) while the lowest flavonoid content was found in hexane leaf extract (12.81mg/g). Present findings were preliminary and further investigation is needed to determine the pharmacological applications of the plant.

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Introduction

In developing countries the use of traditional medicine by utilizing endemic and indigenous plants as sources is widely practiced because of its presumed affordability, availability and cultural importance (Mander, 1998). Plant materials and extracts are mainly prescribed by traditional healers for the treatment of various diseases. These are usually done by identifying the common symptoms of patients and prescribing the type of plant to use (Hewson, 1998). The fundamental basis for plants therapeutic efficacies are the phytochemicals it contains and plants anti-oxidative potentials.

Studies on Philippines indigenous and other local plants phytochemical profile, toxicological property, and antimicrobial potency had grown research interest recently (Penecilla and Magno, 2011; Valle *et al.*, 2015; Uy and Garcia, 2015; Uy and Villazorda, 2015; Latayada and Uy, 2016). The phytochemical studies in the region included: (i) medicinal plant leaves (Peteros and Uy, 2010); (ii) indigenous vegetables leaves and stalks were studied (Baang *et al.*, 2015); (iv) fruit peels (Palmes and Del Rosario, 2012); (v) and herbal vines (Licayan *et al.*, 2016).

None of these literature investigated phytochemical potential of another indigenous plant *Jacquemontia paniculata* (Convolvulaceae).

Convolvulaceae is a family of approximately 50 genera and 1200 species (Lawrence, 1951) have been known among indigenous communities for its medicinal applications. Specific plant to this family is *J. paniculata* widely distributed species across the tropics including the Philippines. It is commonly known as 'ching cham' in Thai, 'aroj pondolandak' in Sundanese, 'lawatan' in Javanese, 'siembukan' in Madurese, and 'himag' in Panay Bisayan - Philippines. Parts of this plant especially the bark, is being used as ointment whereas the decoction of stem/bark is used to treat intermittent fever. Moreover, it is locally known to cure coughs and some other illnesses. Despite the local abundance and herbal use both pharmacological and phytochemical profiles are limited. This study was therefore conducted to evaluate the possible beneficial phytochemical potencies of the aqueous, ethanol, and hexane extracts from the barks and leaves of *J. paniculata*.

Materials and Methods

Sample Preparation

Freshly collected *J. paniculata* bark and leaf samples were placed in plastic bags (see Fig. 1). The bark and leaf samples were washed and air-dried for seven days and then grounded using a blender prior to extraction. The prepared samples were stored in a clean amber bottle.

Fig. 1. Bark and leaf of *J. paniculata* .

Preparation of Extracts and phytochemical tests

Upon collection, the samples were cleaned and subjected to air-drying for about 3 to 7 days. Thereafter, the samples both bark and leaves were cut into strips. The dried bark strips was grounded using a mechanical grinder while the leaves was cut into rectangular or square shapes. The samples were subjected to aqueous, ethanol, and hexane extracts.

For the aqueous extract, the samples were mixed with distilled water and then boiled up until the mixture was concentrated. On the other hand, for the ethanol extract, the samples were milled using a grinder.

The dried powder was soaked to 500mL to 700mL of ethanol for about 3 to 5 days. The solution was then filtered using a whatman filter paper no. 42 followed by concentrating the extracts using a rotary evaporator. On the other hand, another set on 300g of dried and powdered samples were soaked in enough volume of hexane for 44h for hexane extract. The mixture was then filtered and concentrated in a rotary evaporator at a temperature below 50°C (see Fig. 2). The concentrated hexane extract was evaporated over a steam bath to a syrupy consistency.

The plants extracts were then stored in clean and closed-capped containers. For the phytochemical screening, observable results were determined by physical changes such as color change, and formation of precipitate upon addition of chemical reagents in each specific test (see Table 1).

Fig. 2. Concentrating the extracts using the rotary evaporator.

Table 1. Phytochemical qualitative test methods.

Phytochemicals	Specific test
Alkaloids	Mayer's reagent Wagner's reagent
Flavonoids	Bate-Smith and Metcalf method
Saponins	Froth test
Tannins and polyphenols	Ferric chloride test
Anthraquinones	Borntrager's Test
Steroids	Keller-Killiani test
Cyanogenic glycocides	Cyanogenic glycocides

Total flavonoid

Total flavonoid in the plant extract was estimated using aluminum chloride method according to Sahu and Saxena (2013) and Sultana et.al. (2012). Extract samples were evaluated at a final concentrations of 0.1mg/mL and 1mg/mL. While quercitin. Concentrations of 20, 40, 60, 80, and 100mg/mL was used to obtain the calibration curve. A 1mL of aliquot of extract was placed in a 10 mL volumetric flask containing 4 mL distilled water.

The mixture was added with 0.3mL of 5% $NaNO_2$. After 5 min., a 0.3mL of 10% $AlCl_3$ and 2mL of 1M NaOH were added to the above mixture and diluted to mark with distilled water. The solution was mixed/shaken thoroughly and were read against the blank at 510 nm. All determinations were done in triplicates. Total flavonoids content was expressed as quercitin equivalents (mg/g) using the following equation based on the calibration curve: $y = ax + b$, where x was the absorbance and y was the quercitin equivalent (mg/g).

Data Analysis

To summarize the gathered data, each were subjected into different types of statistical means. Descriptive statistics was used in the analysis and interpretation of phytochemical screening. Two-way ANOVA was used to determine if there was interaction between the different parts and solvents for flavonoid contents.

Results and discussion

Phytochemical profile

The aqueous, ethanol, and hexane extracts of *J. paniculata* bark and leaf were screened for the presence of phytochemicals. These were carried employing qualitative (alkaloids, flavonoids, saponins, tannins, anthraquinones, steroids, and cyanogenic glycosides) and quantitative (total flavonoids) tests respectively.

Regardless of solvent used and *J. paniculata* parts (e.g. bark and leaves) flavonoids, alkaloids, saponins, anthraquinones, and steroids were found to be present (refer to Table 2).

Citations (4) References (0)

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Anodendron borneense (King & Gamble) D.J.Middleton Apocynaceae

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