

# Organoleptic and phytochemical analyses of different extracts of *Hydnophytum formicarum* Jack. tubers of Cambodia

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**Abstract:** *Hydnophytum formicarum* Jack. (Rubiaceae) known as the ant plant is a herbal plant grows in Cambodia. This plant is being study due to its therapeutic potential such as anticancer, anti-inflammatory, anti-parasitic, and anti-oxidation. This research aims were to identify organoleptic features of the plants and analyze phytochemical components such as alkaloids, saponins, flavonoids, triterpenoids, tanins, phenols, resins and essential oils from different extracts of *Hydnophytum formicarum* Jack. native to Cambodia. The organoleptic feature was evaluated by means of sense organs such as colour, odour, taste and texture parameters. The dried plant was extracted with three solvents including methanol, ethanol and chloroform, and subjected to the phytochemical analysis. The organoleptic features of the dried *Hydnophytum formicarum* Jack. tubers revealed that the color was light reddish brown; the odor was characteristic; the taste was bland; and the texture was slightly rough. The extracting yields of *Hydnophytum formicarum* Jack. tubers accounted for 3.28% (chloroform extract), 6.84% (ethanol extract) and 7.86% (methanol extract). The phytochemical evaluation of these three solvent extracts gave the positive tests of some phytochemical constituents. The profiles of organoleptic features and phytochemicals of this Cambodian *Hydnophytum formicarum* Jack. are of importance in term of plant drug standardization and its new compound isolation.

## INTRODUCTION

*Hydnophytum formicarum* Jack. (Family: Rubiaceae) tuber is medicinal plant commonly find in south-east asia and generally practice by traditional healers in various ailments such as cardiovascular disease, hepatitis, rheumatism and diarrhea (Nguyen *et al.*, 2004) due to its therapeutic activities such as anti-oxidant (Prommee, 1988), anti-inflammatory and antiparasitic (Prachayasittikul *et al.*, 2008). This study aims to identify organoleptic features and analyze phytochemical constituents containing in *Hydnophytum formicarum* Jack. native to Cambodia.

## RESULTS AND DISCUSSION

## MATERIALS AND METHODS

The dried *Hydnophytum formicarum* Jack. tubers were acquired from local plant drugstore and authenticated the organoleptic feature was evaluated by means of sense organs. The dried plant was extracted with three solvents comprised of methanol, ethanol and chloroform. Each plant was extracted for 15 minutes at room temperature by Ultrasonication-Assisted Extraction (UAE) method. The extracting yields were subjected to the analysis of phytoconstituents including alkaloids, saponins, flavonoids, phenolic compounds, tannins, terpenoids, resins and essential oils.

**Table 1:** The organoleptic study of the dried *H. formicarum* Jack.

**Table 2:** Phytochemical evaluation of *Hydnophytum formicarum* Jack. Tubers

Particulars	Part of plant
	Tuber
Condition	Dried
Color	Light reddish brown
Odor	Characteristic
Taste	Bland
Texture	Slightly rough
Size	10-12 cm long to 30-50 cm wide

Phytochemicals	Chemical Tests	Solvent Extracts		
		Chloroform	Ethanol	Methanol
Alkaloids	Wagner	Positive	Negative	Negative
	Mayer	Positive	Positive	Negative
Saponins	Froth	Positive	Negative	Positive
Flavonoids	Ammonium	Positive	Negative	Negative
Terpenoids	Salkowski	Negative	Negative	Positive
Tanins	Ferric Chloride	Negative	Negative	Negative
Phenols	Ferric Chloride	Negative	Negative	Positive
Resins	Turbidity	Negative	Positive	Negative
Essential Oils	NaOH-HCl	Positive	Negative	Negative

Note: The authentication of dried plant is made by University of Puthisastra (UP)-Herbarium (UPPPH-050031)



**Figure 1.** *H. formicarum* Jack., Cambodia

**Class:** Magnoliopsida  
**Order:** Gentianales  
**Family:** Rubiaceae  
**Genus:** *Hydnophytum*  
**Species:** *formicarum*  
**B. name:** *Hydnophytum formicarum* Jack.  
**Khmer name:** ម្រាចស្លតង្កី  
**English name:** Ant plant  
**Plant type:** Tuber  
**GPS:** 12°34'2"N 107°25'6"E

The result of organoleptic showed that *Hydnophytum formicarum* Jack. that obtained from local plant drug store is proper for the research. Each extract contained alkaloids, saponons, flavonoids, terpenoids, phenols, resins and essential oils which has some therapeutic activities such as cardiovascular, anti-oxidant, antimicrobial (Prachayasittikul *et al.*, 2008), antiparasitic, anticancer (cytotoxic activity) (Hasmah *et al.*, 2008), and anti-inflammatory to treat hepatitis, rheumatism, diarrhea (Nguyen *et al.*, 2004), headache, relief skin rash and use as neurotonic (Prommee, 1988).

## CONCLUSION

*Hydnophytum formicarum* Jack. showed the presence of phytochemicals as positive of alkaloids, saponins, flavonoids, phenols, tannins, triterpenoids, resins, essential oils within three solvents, except of tanins. This scientific data is a path toward the validation of compounds remains in the *Hydnophytum formicarum* Jack. It is of great benefit to a further research of compound isolation.

## REFERENCES

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