

SAMPLE COLLECTION OF MEDICINAL ORCHIDS FOR PHYTOCHEMICAL SCREENING AGAINST TUBERCULOSIS AND LEISHMANIASIS DISEASES FROM WEST KAMENG DISTRICT, ARUNACHAL PRADESH, INDIA

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Abstract

Medicinal orchids viz. *Rhyncostylis retusa* (L.) Blume, *Tropidia curculigoides* Lindl. and *Satyrium nepalense* D.Don. were collected and screened for Tuberculosis & Leishmaniasis. Biological activities performed on three species are antibacterial, antitubercular and antileishmanial. The presence or absence of secondary metabolites are shown by + or – in each extract.

Keywords: Medicinal orchids, Tuberculosis, Leishmaniasis

INTRODUCTION

Various field trips were conducted in West Kameng district, Arunachal Pradesh to collect medicinal orchids like *Rhyncostylis retusa* (L.) Blume, *Tropidia curculigoides* Lindl. and *Satyrium nepalense* D.Don. The species are sparsely distributed in tropical and subalpine forest zone. In the present study, 3 species have been screened for Tuberculosis and Leishmaniasis. India has the largest number of TB cases in the world and is caused by bacteria (*Mycobacterium tuberculosis*). The disease is a communicable through germs into the air. Leishmaniasis is a emerging disease in India and caused by a protozoa parasite transmitted to humans by the bite of infected female phlebotomine sandflies.

MATERIALS AND METHODS

For collection of the species three source of study were followed (i) consultation of OHT (Orchid Herbarium Tippi), (ii) literature survey and (iii) in person contact. Amongst these, (ii) and (iii) were more reliable for the present collection. The difficulties were due to the uncommon distribution of the species.

However, *Rhyncostylis retusa* (L.) Blume, *Tropidia curculigoides* Lindl. and *Satyrium nepalense* D.Don were collected from Doimara, Tippi and Sange at an altitude (in metre) of 357, 339 & 3072 in the geographical location of N 26058'02.0" & E 92025'10.3", N 27001'14.9" & E 92036'44.2" and N 27027'30.1" & E 92006'17.4" respectively.

Guess and Collection

It was difficult to collect uncommon, herb & terrestrial & epiphytic species from a dense forest. During the field trips uncertainty prevails due to a variety of variations such as (i) distribution nature of the species, (ii) species to species & (iii) type of forests. The forest type is varied according to the altitudinal variation. So, altogether habitat ecosystem is encompassed by forest type. Under such condition lead was achieved by using (i) GPS obtaining geocoordinates and altitude (m) reading & (ii) prescribed habitat study of species. Collection was possible by comparing flora of the region with GPS altitudinal reading (200 m-3072 m).

Medicinal Uses

***Rhyncostylis retusa* (L.) Blume**

One gram of the paste is taken orally with water on an empty stomach twice a day for seven days to cure blood dysentery (Dash et al., 2008). The plant is also used as emollient. Pasted leaf is applied externally to cure wounds and skin diseases (Roy et al., 2007).

A preparation of indigenous system of medicine is used in rheumatic diseases. In various preparation of this plant have been used as cure for asthma, tuberculosis, nervous twitchings, palpitations, kidney stone, menstrual disorders, infantile epilepsy, cramps, vertigo (Dalgado, 1898).

Tropidia curculigoides Lindl.

A decoction prepared from roots is used for diarrhea (Khasim & Rao 1999). Boiled extract of whole plant is used for treating malaria (Chopra et al., 1969).

Satyrium nepalense D.Don

Decoction of tubers, roots and stems of the plants has been used in various infectious diseases and also as a nutritional supplement since ancient time. It is also used as a food, tonic, in diarrhea, malaria and dysentery (Saklani et al., 2011).

Table 1: Moisture/water content in percentage (%)

SN	Name of species	Weight (kg)		$\% = \frac{w1 - w2}{w1} \times 100$	Dried in days	Habit
		Initial (w1)	Final (w2)			
1.	<i>Rhyncostylis retusa</i> (L.) Blume	9.750	3.9	60	90	Epiphytic
2.	<i>Tropidia curculigoides</i> Lindl.	3.470	1.6	53.89	90	Terrestrial
3.	<i>Satyrium nepalense</i> D.Don	45.00	4.233	90.593	90	Terrestrial

RESULT

Adult plant 3.9 kg and seedlings 450 gm of *Rhyncostylis retusa* (L.) Blume, 275 gm was prepared from both collection and TC lab produced seedlings respectively. Both 1.6 kg *Tropidia curculigoides* Lindl. and 4.233 kg *Satyrium nepalense* D. Don were from collection only. Each species weighed after they were properly dried in sun light condition for phytochemical plant material.

Biological activities performed on *Rhyncostylis retusa* (L.) Blume, *Tropidia curculigoides* Lindl. and *Satyrium nepalense* D.Don

They are antibacterial, antitubercular and antileishmanial.

Bioactive fractions

Rr Et2O, SnF n-Hex, SnP n-Hex showed significant activity against antibacterial, antimycobacterial and leishmanicidal activity. Tc Roots Et2O showed significant activity against MDR *E. coli* and moderate activity against *Enterococcus* sp.

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Table 2: Phytochemical screening data of *Rhyncostylis retusa* (L.) Blume, *Tropidia curculigoides* Lindl. and *Satyrium nepalense* D.Don

SN	Extract / Fraction name	Alkaloids	Flavonoids	Steroids	Reducing sugars	Cardiac glycosides	Triterpenoids	Anthraquinones	Tannins	Phlobatannins	Saponins
1.	RrR Et2O	+	-	-	-	+++	+++	-	-	+++	++
2.	RrR BuOH	+	+	-	-	-	++	-	-	+++	-
3.	RrR Aq ext	-	-	-	-	++	-	-	-	+	+
4.	RrS Et2O	+	+	+	+++	++	+++	+	-	+	+
5.	RrS BuOH	+	+	+	-	-	++	-	-	+++	-
6.	RrS Aq ext	+	-	-	-	-	+	-	-	+++	-
7.	RrL Et2O	+	-	-	-	-	-	-	-	+	-
8.	RrL BuOH	+	-	-	-	-	-	-	-	++	+++
9.	RrL Aq ext	+	-	-	-	-	-	-	-	+	-
10.	TcR Et2O	+	++	++	-	-	+	+	++	+	++
11.	TcR BuOH	-	-	-	+	-	++	-	-	-	-
12.	TcR Aq ext	-	-	-	++	+++	-	-	-	-	+
13.	TcS Et2O	-	++	++	-	-	+++	++	-	-	-
14.	TcS BuOH	-	-	-	+	-	-	-	-	-	-
15.	TcS Aq ext	-	-	-	+	+++	-	-	-	-	-
16.	TcL Et2O	-	+	-	-	-	-	+	+	++	-
17.	TcL BuOH	-	-	-	+	-	-	-	-	-	+
18.	TcL Aq ext	-	-	-	+	++	-	-	-	-	++
19.	SnP n-Hex	+	-	-	-	-	++	-	+	-	++
20.	SnP DCM	-	++	-	-	-	++	-	-	-	+
21.	SnP EtOAc	+	+++	-	-	-	-	+	+	-	+
22.	SnP Aq ext	-	-	++	-	+	-	-	++	-	+
23.	SnF n-Hex	+	+	-	+	+++	+++	-	+	+++	++
24.	SnF DCM	-	++	-	+	-	++	-	+	-	+
25.	SnF EtOAc	+	+++	+	-	+	-	+	+	-	+
26.	SnF Aq ext	-	-	++	-	++	-	+	++	-	+
27.	SnS & L n-Hex	+	-	-	+	-	++	-	+	-	++
28.	SnS & L DCM	-	++	-	-	-	-	-	-	-	+
29.	SnS & L EtOAc	+	+	-	-	+	-	-	+	-	+
30.	SnS & L Aq ext	-	-	++	+	+	+	-	++	+	+

Et2O-Diethyl ether, BuOH-Butanol, Aq-Aqueous extract, n-Hex-n-Hexane, DCM-Dichloromethane, EtOAc-Ethylacetate, MeOH-Methanol; “+++” indicates highly present, “++” indicates moderately present, “+” indicates present in traces, “-“ indicates absent. Alkaloids, Flavonoids, Steroids and Tannins were detected by NaOH-HCl test, Salkowski’s reaction, dragonorff reaction and ferric chloride test respectively. Additional tests were carried out to check the presence of reducing sugars, cardiac glycosides, phlobatannins, Anthraquinones, saponins and terpenoids (Rajesh et al., 2010).

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DRYING PROCESS



Rhyncostylis retusa (L.) Blume



Tropidia curculigoides Lindl.



Satyrium nepalense D. Don