Research Article

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LICHEN GENUS *USNEA* IN KARNATAKA

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ABSTRACT

Usnea is a well-known genus of lichen for its medicinal uses all over the world. The lichen genus *Usnea* has fruticose morphology with pendulous or erect thallus and characterized by the presence of usnic acid. The present study aims to know the diversity of *Usnea* in Karnataka. The genus *Usnea* is identified up to species level based on its morphological, anatomical and chemical characters. The different forests types in Karnataka were surveyed for the work. We recorded 6 species of *Usnea* from the different parts of Karnataka. The higher altitudinal regions of the temperate forests harbours rich source of *Usnea.*

Keywords: Karnataka, *Usnea,* Usnic acid, fruticose thallus

INTRODUCTION

The state Karnataka is situated in the south western part of India. The geography of Karnataka contains all types of topographical variations such as mountains, coastal areas, hills and plateaus. One of the three biological hotspots in India, Western Ghats runs through Karnataka. It is known as Sahyadri or Malenadu. The average height of Sahyadri is about 900 meters. The highest altitudinal range of 1930 m is observed in Mullayangiri peak of Chikkamagaluru district[1]. The altitudinal variation of less than 300 m above sea level to an average of 1500 m is observed here.

The state Karnataka is blessed with magnificent amount of forests. It includes different types of forests such as Evergreen and semi-evergreen forests, moist deciduous, dry deciduous and thorny forests. Lichens are the unique organisms with the combination of both algae and fungi. The rich growth of lichens can be seen in most tropical forests. The study of lichens in south India is mainly focused in Nilgiri and Palani hills[2,3]. Only a little knowledge is known about the diversity of lichens in Karnataka[4-8].

The lichen genus *Usnea* belonging to the family Parmeliaceae is a lichenized ascomycetes consisting of more than 350 species all over the world[9]. *Usnea* is fruticose lichen with pendulous or erect thallus, which can be easily identified by its thread like morphology. The pigmentation of the basal part of the thallus, cortex and medulla, shape and type of branching are some of the morphological characters which don't change with the change in geographical area. The present study aims at the categorization of all the *Usnea* species of Karnataka.

MATERIAL AND METHODS

The present study is based on the collections made from August 2014 to December 2016. The survey was carried out in different parts of Karnataka, such as Shimoga, Chikkamagaluru, Uttara Kannada, Dakshina Kannada, Udupi, Dharwad, Belgaum, Gadag, Haveri, Ballary, Chitradurga, Davanagere, Tumkuru, Chikaballapura, Kolara, Mysore, Chamarajnagar and Kodagu districts, India.

The collected samples were taken to the laboratory, air dried and stored in lichen herbarium of K.F.G.C., Shikaripura. The voucher specimen number LHKFGC0001 to LHKFGC0042 were collected during the present work and are identified up to species level. The P^H of the substrate trees was identified. The ecological parameters such as temperatures, humidity, altitude, latitude were noted at the place of collection. The morphological characters are noted down. The anatomical characters studied with the help of binocular microscope. The chemical tests are carried out to identify the secondary metabolites present in it[10,11]. The identification of *Usnea* was done on the basis of morphological, anatomical and chemical characters[12,13].

RESULT AND DISCUSSION

Usnea was collected in different localities of Karnataka. The collected *Usnea* are identified as 6 different species based on it anatomy, morphology and colour test (Table 2). All the *Usnea* species collected were found in the temperate forests that is evergreen and semi-evergreen forests of the state. The deciduous and scrubby forests have no traces of *Usnea.* The *Usnea* species were collected at the altitudinal range of 600 m to 2350 m (Table 1). More number of *Usnea* thallus was found in the higher altitudinal region of 2350 m that is in Mullayyangiri of Chikmagaluru district. Only few thallus were observed in lower altitudinal region.

The present study reveals that the Karnataka state harbours 6 species of *Usnea* lichens (Plate 1 and Plate 2). More number of lichens was collected from temperate forests of higher altitudinal

region. The diversity of *Usnea* lichens in Karnataka state is rich when compared to diversity of nearby states Goa and Maharashtra[14]. But the states of Kerala and Tamil Nadu shows very rich diversity of *Usnea* lichens when compared to Karnataka[4,15,16].

CONCLUSION

Karnataka is a state with rich biodiversity. The state is surrounded by different types of forests. *Usnea* Adans. is a large genus in the family Parmeliaceae, with more than 350 species that are widely distributed in polar, temperate and tropical regions. The present work showed the occurrence of 6 species of *Usnea*. Among them *U. ghattensis* and *U. undulata* are available in large quantity in Mullayangiri. The other 4 species are found with very few thallus. The largely available species can be sustainably used for their economical purposes.

Table 1: *Usnea* collected from different localities with altitude and substrate

S. No.	Name	Locality	Altitude (m)	Substrate
1	*Usnea ghattensis*	Karnataka, Dakshina kannada dist. Sullia, Karnataka, Chikmagaluru dist. Mullayangiri	1900 2350	Tree
2	*Usnea leucospilodea*	Karnataka, Shimoga, Sagar, Sharavati River basin, Mattikoppa	603 m	Fallen twig
3	*Usnea luridorufa*	Karnataka, Dakshina Kannada, Sulllia, Subramanya Kumaraparvata	1200 m	Bark
4	*Usnea orientalis*	Karnataka, Chikkamagaluru Dist. Kemmangundi,	1000 m	Bark
5	*Usnea rigidula*	Karnataka, Dakshina kannada dist. Subramanya, Kumaraparvata	1500 m	On stones/ bark
6	*Usnea undulata*	Karnataka, Chikmagaluru dist. Mullayangiri	2340 m	stones

Table 2: The result of colour tests shown in collected *Usnea* species

S. No.	Species name	Colour test		
		K test	K test	K test
1	*Usnea ghattensis*	-	-	-
2	*Usnea leucospilodea*	+	+	-
3	*Usnea luridorufa*	+	+	-
4	*Usnea orientalis*	+	+	-
5	*Usnea rigidula*	+	+	-
6	*Usnea undulata*	-	-	-

PLATE 1

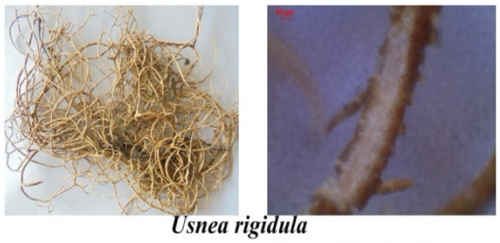
Usnea ghattensis

Usnea leucospilodea

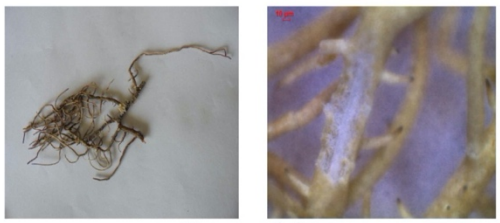
Usnea luridorufa

PLATE - 2

Usnea orientalis



Usnea rigidula



Usnea undulata

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