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Journal of biotechnological sciences [ISSN: 2308-0043]

Ethnobotanical and Morphological differences of *Mentha longifolia* (L.) Hud in selected Five Ecological Zones of District Hunza.

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Abstract

Mentha longifolia (L.) Hud is a prominent herb propagated in different areas of District Hunza Pakistan. Our studies showed a significant different in morphological parameters and ethnobotanical uses. According to the Ecological levels, in zone-1 the plant was only used for the cure of jaundice. In zone-2 the plant showed more potential to treat diseases like fever, cough, coldness, body pain, stomach burning jaundice and obesity. At zone-3 the rapid increase in altitude shows some change again in curing illness such as: control bleeding, stomach ache, BP control, diabetes and help in proper respiration when moving to height. In zone-4 the plant helps to control Bp, and control respiration concentration, weight loss, control BP, increase in white blood cells, stomach ache and jaundice, gastrointestinal relief. In zone-5 again the diseases are repeating but some changes occur such as: stomach pain, flu, jaundice and constipation. Our studies shows a significant difference between the selected zones.

Abstract: *Mentha longifolia* (L.) Hud; Ecological Levels; Morphological Parameters; Ethnobotanical Uses.

Introduction

Plants those contain some therapeutic properties or having medicinal values are known as to be medicinal plants. Medicinal plants are the best and easy source of curing human disease, it is usually found in ruler areas (Okigbo, Anuagasi, & Amadi, 2009) Some herbal plants are used for the therapy of different diseases, by using the original plants, are considered as to be a

very few side effects than synthetic one (Perry, Pickering, Wang, Houghton, & Perry, 1999). It is in the information that about more than 2900 species of plant have been reported in the northern area of Pakistan; from which about 124 species are those which having medicinal values. Pakistan's northern area is also known as Gilgit Baltistan it's having a unique and diverse ecosystem. This place is situated in the junction of three huge mountains range. i.e. Himalia, Hindukash and Karakoram (Shinwari, 2010). Its mountains are covered by the snow and the valleys are very narrow. The area is situated among 35-37 North and 72-75 East. By the estimation about 0.86% is in cultivation but its twice is not under agriculture means that area is arable, some of the land is under cover by mountains, glaciers but about 0.4% is under forest. As this area of people having different way of life, culture and norms, so they use those plants in many different ways for example:- use as food, fire, shelter, and also uses as medicine (Khaliq et al., 2013).

Materials and method

A survey was carried out in District Hunza Gilgit Baltistan. Northern area of Pakistan having high mountains and unique biodiversity which is very high from sea level. The different seasons overwhelmed the nature; it's too cold in winters and warmer in summers. To document the specific plants medicinal usages and its morphological appearance. That how the same species of plant varies from zone to zone and what morphological changes did the plant get such as, its leaf structure, color and its size gets change or become small or large due to zones differ from each other. And how the medicinal value increases or decreases due to different zones (which having different altitude, latitude, and longitude).

The plant *Mentha longifolia* (L.) Hud. have different medicinal uses such as: used for high BP, asthma, jaundice and fever. I have selected five zones in District Hunza Region, namely: 1st zone was Shishkat, 2nd was Hussaini, 3rd zone was Khyber, 4th Moorkhun and the 5th was Sertiz. Collected data from each zone on that specific plant, of about 10 people from each zone, and filled the questioner very fairly like their personal information, about the plant, that which kind of diseases it cures, the plants maturation period, places it found, plant part used, administration, along with other plant, side effect etc. Then while working on the plant arranged it with its Vernacular Name, family name, botanical name, part used for medicine, flowering and fruiting period and its ethnobotanical uses. Collected all morphological parameters of whole plant's part one by one: i.e. height of plant, height of root, leaf sizes, stem diameter, root diameter, node distance and length of pedicels. Including; counted leaves, roots, tillers and branches of the plant. Identified the leaf arrangement, root shape and the color of leaf, root and stem.

The Plant *Mentha longifolia* (L)hud

Family:	Poaceae
Botanical name:	<i>Mentha longifolia</i> (L.) Hud.
Vernacular name	Wadan
Plant part used	Its leaves and flowers are used.
Occurance	It is usually found in wet and in the shade areas
Medicinal uses	The plant menthe longifolia (L) is used for the cure of high blood pressure, fever, jaundice, and asthma.

Result and Discussions

Five Zones were selected for the study. Latitude, Altitude and Longitude is given in Table-1.

Table-1: Five zones latitude, longitude and altitude

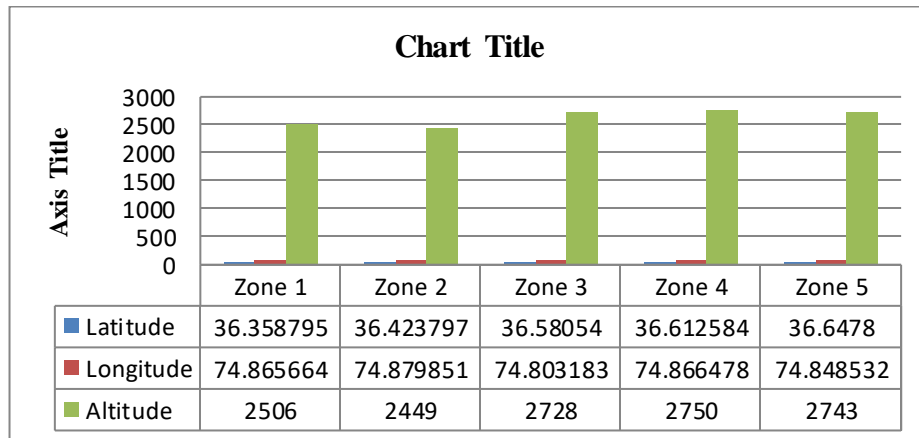
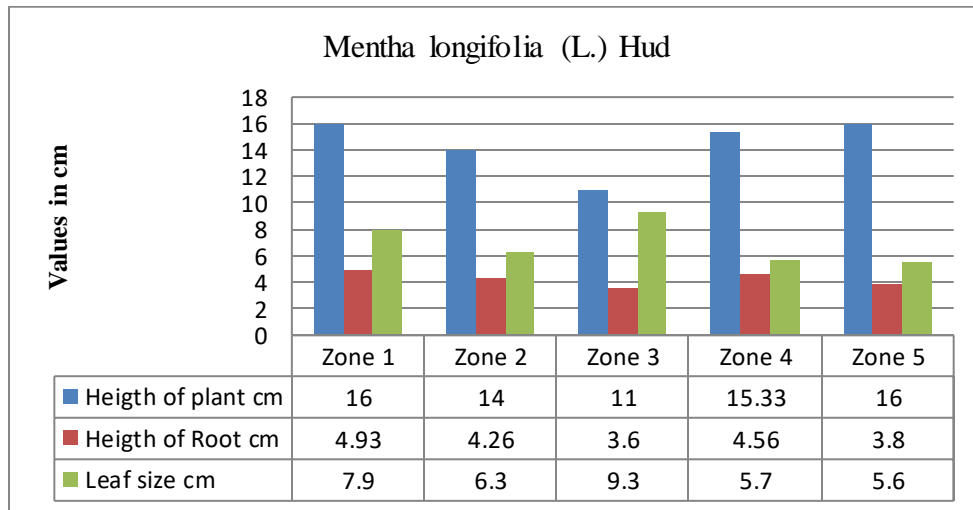
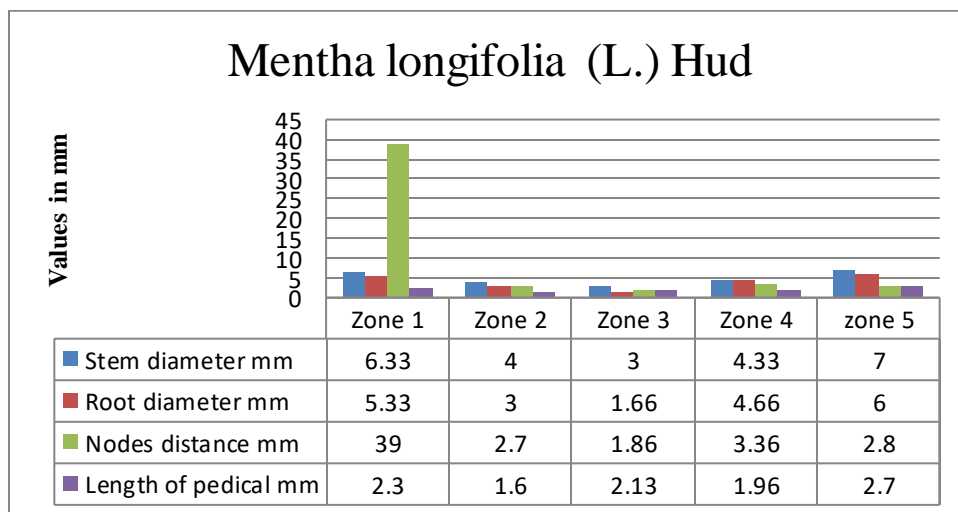


Table-2: Representing the height of plant and length of root of plant botanically named *Mentha longifolia* (L).



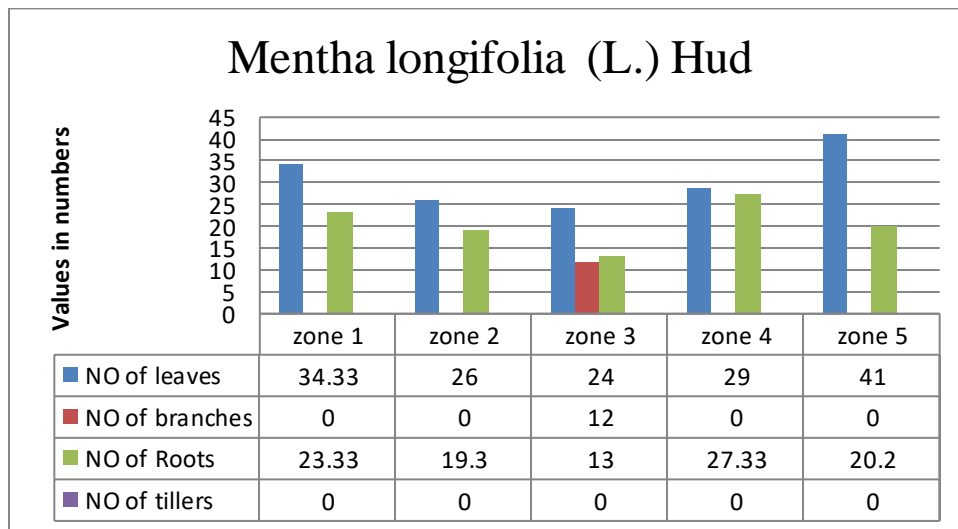
The height of plant of menthe longifolia (L) is: as we move from zone 1st to zone 3rd it gradually decreases but it again increases from zone 4th to 5th. It has only shown high decrease ratio in 3rd zone. Height of the root is the same as in height of plant it is gradually decreasing from 1st to 3rd zone but increasing upward in zone 4 and 5. The leaf size is decreasing from zone 1 to zone 2 but increasing in zone 3 and again it's decreasing from zone 4 to zone 5.

Table-3: This graph is representing the stem diameter, root diameter, nodes distance and length of pedicel of plant botanically named *Mentha longifolia* (L).



Here in this plant stem diameter from zone 1 to zone 3rd is decreasing but from zone 4 it has increased a bit and then in zone 5 it reduces again. The root diameter has decreased from zone 1st to zone 3rd and increasing in zone 4th and zone 5th. Nodes distance in the plant has found to be verd increased in 1st zone and then it is loereing down as we move from 1st to 3rd zone. It has also slowly increased in zone 4 and zone 5. The length of pedicel is decreasing from 1st to 3rd zone and then slowly increasing from zone 4th to zone 5th.

Table-4: This graph is representing the number of leaves, branches, roots and tillers, of plant botanically named *Mentha longifolia* (L).



The numbers of leaves are gradually decreasing as we move from 1st to 3rd zone and then it is showing an increase in zone 4th to zone 5th. In this plant numbers of branches were found in very rare case. Here the numbers of branches were found in only zone 3rd. Number of roots are the same as in the number of leaves occur. It is decreasing from 1st zone to 3rd zone and increasing in 4th zone but shoes again decrease in 5th zone.

Table-5: This table is representing leaf, root and stem color of Mentha longifolia (L).

	Leaf color	Root color	stem color
zone 1	dark green	white brown	light brown
zone 2	dark green	white brown	light brown
zone 3	dark green	white brown	light brown
zone 4	dark green	white brown	light brown
zone 5	Green	white brown	light brown

The table for leaf, root and stem color shows no change from zone one to zone 5. They all remain the same.

Table-6: This table is showing leaf arrangement of plant Mentha longifolia (L).

Leaf arrangement	
Zone 1	Single
Zone 2	Single
Zone 3	Single
Zone 4	Single
zone 5	Single

The table for leaf arrangement shows single leaf from zone 1 to zone 5.

Table-7: This table shows root shape of plant Mentha longifolia (L).

	Root shape
Zone 1	Fibrous
Zone 2	Fibrous
Zone 3	Fibrous
Zone 4	Fibrous
zone 5	Fibrous

Table-8: Ethnobotanical studies of Mentha longifolia (L). in Five Zones

	Name	Age	Gender	Education	Prominent Diseases	Other Disease	Plant part used	Administration	Maturation period	Along with other plant	Side effects
Zone-1	Mujahid Ullah	60	Male	Middle	Jaundice	nil	Whole plant	Dry and Grind (tea)	March-August	nil	nil
Zone-1	Amir ullah	72	Male	Middle	Jaundice	Nil	Leaf, stem	Tea	April-august	used with cheese	
Zone-1	Hassan Jan	65	male	Metric	Jaundice	nil	whole plant	Paste and tea	April to aug	nil	nil
Zone-2	Khasyat Numah	78	female	Nil	fever ,coldness	cough, flu, body ach	leaves	Tea and paste	March-August	no	over dosage can cause death
Zone-2	Zulaikha	72	Female	Nil	control Stomach jaundice	Burning and	leaf	Tea or used in meals	April to Oct	no	No
Zone-2	Bibi zumrad	55	female	nil	Jaundice, obesity control	BP	whole plant	Tea and paste	mar to Aug	wheat	Nil

Zone-3	Fateh Ali Shah	57yrs	Male	B.A	Control bleeding	Nil	Leaves	Direct/ paste or powder	April- Aug	nil	Nil
Zone-3	Abida Jabeen	38	Female	Metric	Stomach ache	used to control respiration when moving to height	Leaf, Seed	Intake directly	Mar – Oct	mixed with water	no
Zone-3	Imam dad	55	Male	FSc	control BP	diabetes	whole plant and leaves	Tea	Mar -sep	nil	no
Zone-4	Hussain Ali Khan	58yrs	Male	primary	control Bp, and control respiration concentration		Leaves	tea	May- Aug	with mint	No
Zone-4	Amjad Ali	60	Graduation	Male	Jaundice	weight loss, control BP, increase in white blood cells	whole plant	powder, tea, used in meals for good smell	Mar - Oct		No
Zone-4	Sifat Ullah	72	Male	Primary	stomach ache and jaundice	Gastrointestinal relief	leaves	Tea and powder	April - Oct	food, water	No
Zone-5	Malika Jahan	60yrs	Female	nil	Jaundice	stomach ach	leaves	tea/ vegetable powder form	March- Oct	nil	Nil
Zone-5	Doran bakh	80yrs	Female	nil	Jaundice	Nil	seed	mix with wheat, then grind and mix it with yogurt	March- Oct	nil	Nil
Zone-5	Ghulam Amin	62	Male	BA	Constipation	Nil	whole plant	powder form	Mar - Oct	Milk	
Zone-5	Bibi muhnut	60	female	nil	Stomach pain and flu	nil	leaf and stem	tea or paste	mar- Oct	nil	
	Sultana Jabeen	28	female	BA	Jaundice	nil	whole plant	grind	tea	nil	Nil

As we move about the five zones their Altitude, latitude and longitude are different from each other that is why the plant gets diverse medicinal uses. As the altitude of zone one is higher than zone 2 and after that in zone 3 and 4 it is increasing but then in zone 5 it is again little decreased. Here according to the altitude, in zone one the plant was only used for the cure of jaundice and nothing else. In zone 2 the plant gets more potential to treat diseases like fever, cough, coldness, body pain, stomach burning jaundice, and obesity. At zone 3 the rapid increase in altitude shows some change again in curing illness such as: control bleeding, stomach ache, BP control, diabetes and help in proper respiration when moving to height. In zone 4 the plant helps to control Bp, and control respiration concentration, weight loss, control BP, increase in white blood cells, stomach ache and jaundice, Gastrointestinal relief. In last zone again the diseases are repeating but some changes occur such as: stomach pain, flu, jaundice and constipation. Our studies shows a significant difference between the selected zones.

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