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Comparative study of moisture content of ethnomedicinal plants used in Ranchi district of Jharkhand for curing chronic kidney injury

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Abstract- Jharkhand's Ranchi district has been a storehouse of vast natural resources, including vegetational abundance. The people that dwell in the area have their own traditions and taboos. Chronic kidney disease is the one of the major problem in India and all over the world. Some common plants like *Coriandrum sativum* L. and *Moringa oleifera* Lam. are used in this problem. The study was conducted to investigate moisture content in leaves of these two plants.

Key words: Moisture content, ethnomedicinal plants, chronic kidney disease, tribal communities.

INTRODUCTION

Throughout the history of human society, man and plant have had a very close relationship.¹ Ranchi is the capital of Jharkhand. Traditional treatments for various diseases are mostly plants used by the tribals of Ranchi district. Chronic Kidney Disease (CKD) is one of those diseases. Chronic kidney disease is a gradual loss over a period of months to years of kidney function. It is widely believed that once there has been sufficient initial damage, no matter what the cause, renal failure inevitably progresses.² The CKD may be associated with coexistent risk factors, such as hypertension, proteinuria, glycemia, anemia, and disturbances of lipid or mineral metabolism.³

The comparative study of moisture content of some plants, which are used in chronic kidney injury, was done. *Coriandrum sativum* L. is a medicinal and aromatic plant

from the Apiaceae family that is found all over the world⁴ and *Moringa oleifera* Lam. is a plant that belongs to the Moringaceae family and is considered under used. The plant is also known as drumstick, sahjan or sohanjana in India.⁵ Both plants are used to cure chronic kidney injury. Indigestion, worm infections, rheumatism, loss of appetite, convulsions, sleeplessness, anxiety, and joint pain have all been treated using *Coriandrum sativum* L.⁶ *Moringa oleifera* Lam. leaves are the most often used, and they have been shown to be effective in CKD as well as a number of other chronic conditions, such as hyper cholesterolemia, diabetes, hypertension, insulin resistance, non-alcoholic liver disease, and general inflammation.⁷

The moisture level of harvested plants is often high, ranging between 60 and 80 percent. If the moisture content is not considerably reduced, dangerous biological processes can mature. As a result, the beneficial active

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ingredient in herbs can be eliminated, and the medications' outward qualities can deteriorate.⁸ The amount of moisture in a sample is expressed as a percentage of the sample's initial weight. The difference between initial weight of fresh leaves and final weight of same leaves after drying is the moisture content. The moisture content of each plant was estimated as a percentage, which differed from one to the next.

MATERIALS & METHODS

In study of moisture content, plants of two different family were harvested during early morning from the different areas of Ranchi district. The major blocks for collection of plants in Ranchi district has been shown in Fig. 1. Plants species were identified with the help of Botany of Bihar and Orissa.^{9,10} The collected leaves were properly cleaned twice in running tap water to remove any dirt or surface contaminants that may have been present. The leaves were washed and then dried in a cold area before being weighted in the weighting machine. The leaves were then placed in a hot air oven at 55°C for half an hour. This activity was repeated 3-4 times. The dried leaves were then weighed. The difference between initial weight of the green leaves and final weight after drying was the moisture content. Percentage of moisture content has been calculated with this formula:

$$\text{Moisture content} = \frac{\text{Initial weight of leaves} - \text{final weight after drying}}{\text{Initial weight of leaves}} \times 100$$

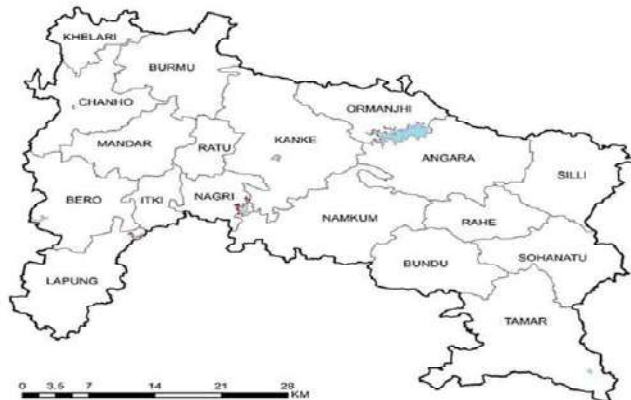


Fig. 1- Different blocks of Ranchi district for collection of plants.

RESULT & DISCUSSION

The comparative study of moisture content of two ethnomedicinal plants viz. *Coriandrum sativum* L. and *Moringa oleifera* Lam. has been done. *Coriandrum sativum* L. has a high moisture level, while *Moringa oleifera* Lam. has low moisture content as shown in table 1 & 2. The comparative study of weight of dried leaves (in gm) for *Coriandrum sativum* L. and *Moringa oleifera* Lam have been shown in Fig.2. It is found that *Moringa oleifera* Lam. has relatively high residue after drying. The *Moringa oleifera* Lam. plants have a lot of therapeutic properties as it has low average moisture content (69.91%) as shown in Fig.3. Their regular use can help prevent chronic renal disease. The *Moringa oleifera* Lam. plants can be used in our daily life to improving the filtration rate of kidney.

Table 1: Moisture content of *Coriandrum sativum* L.

Material	Number of observation	Weight of fresh leaves (in gm)	Weight of dried leaves (in gm)	Difference (in gm)	% of Moisture content
Fresh leaves of <i>Coriandrum sativum</i> L.	1.	10	2.02	7.98	79.8%
	2.	10	1.96	8.04	80.4%
	3.	10	1.96	8.04	80.4%
	4.	10	1.94	8.06	80.6%
	5.	10	1.94	8.06	80.6%
	6.	10	1.98	8.02	80.2%
	7.	10	1.88	8.12	81.2%
	8.	10	1.82	8.18	81.8%
	9.	10	1.86	8.14	81.4%
	10.	10	1.82	8.18	81.8%
Total					808.2%

Average Moisture content = 80.82%

Table 2: Moisture content of *Moringa oleifera* Lam.

Material	Number of observation	Weight of fresh leaves (in gm)	Weight of dried leaves (in gm)	Difference (in gm)	% of Moisture content
Fresh leaves of <i>Moringa oleifera</i> Lam.	1.	10	2.90	7.10	71.0%
	2.	10	2.92	7.08	70.8%
	3.	10	3.06	6.94	69.4%
	4.	10	2.86	7.14	71.4%
	5.	10	2.98	7.02	70.2%
	6.	10	2.96	7.04	70.4%
	7.	10	2.88	7.12	71.2%
	8.	10	3.22	6.78	67.8%
	9.	10	3.10	6.90	69.0%
	10.	10	3.21	6.79	67.9%
Total					69.91%

Average Moisture content = 69.91%

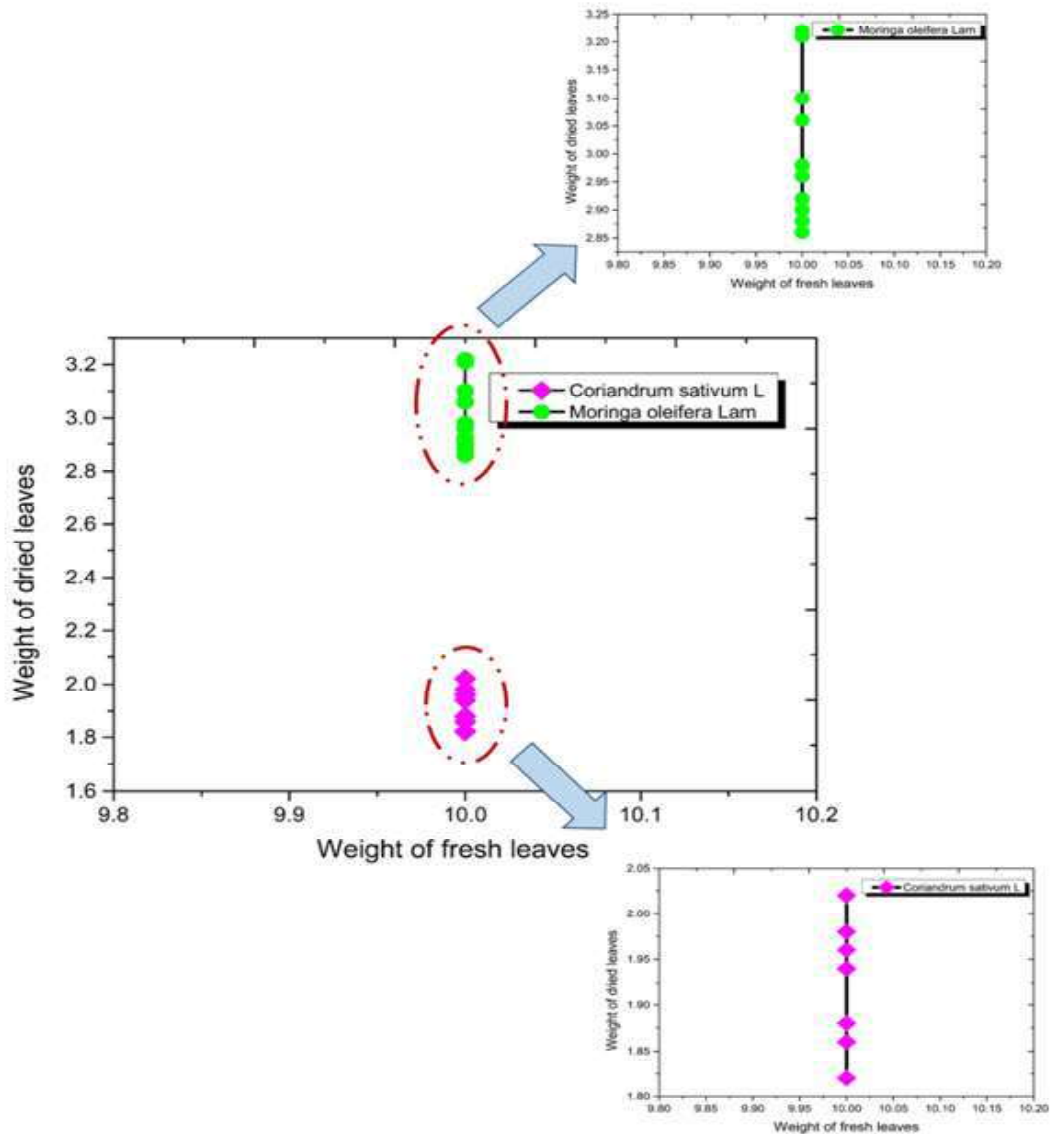


Fig. 2: Comparison of weight of dried leaves (in gm) for *Coriandrum sativum* L. and *Moringa oleifera* Lam. (Initial weight is taken 10 gm)

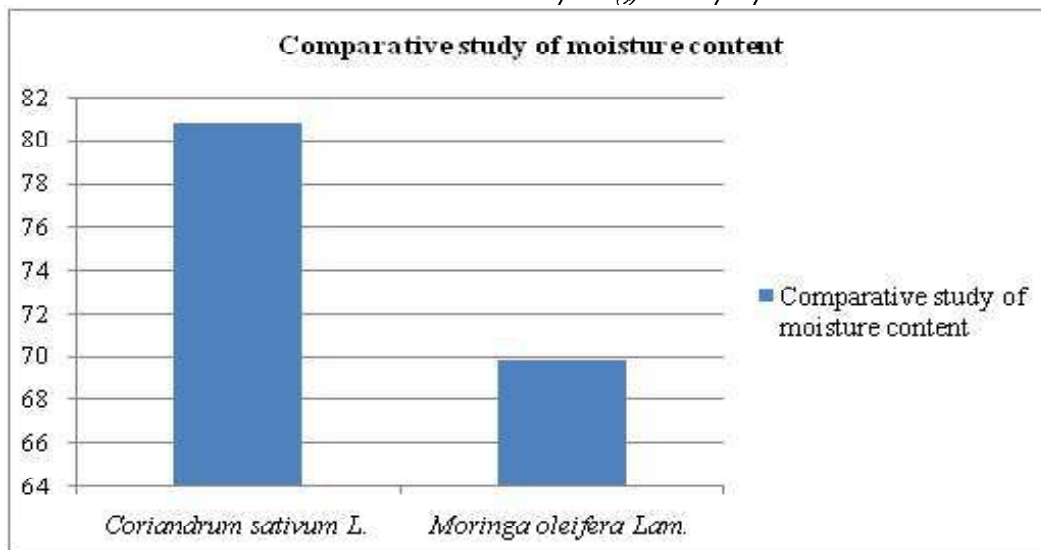


Fig. 3: Average moisture content of *Coriandrum sativum* L. and *Moringa oleifera* Lam.

CONCLUSION

The present study shows the comparative analysis of moisture content of two ethnomedicinal plants viz. *Coriandrum sativum* L. and *Moringa oleifera* Lam. It is observed that *Moringa oleifera* Lam. has relatively high residue and low average moisture content, i.e. 69.91%. This signifies that *Moringa oleifera* Lam. plants can preferably use to help for preventing chronic renal disease and other severe kidney injuries.

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