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Some medicinal plants used for the treatment of thyroid disease in rural area of district Ambedkar Nagar, Uttar Pradesh, India

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Abstract

Thyroid problems are on rise today. This increase is in part due to more and more frantic life styles people engage in today and it is also because of a lack of suitable nutrients in the soil. Many people are affected by hypothyroidism which is an under productive thyroid condition and do not even comprehend it. Hyperthyroidism is a condition in which the thyroid is overactive. Medicinal plants are part of social life tribals and rural areas in India. Since ages, rural communities in district Ambedkar Nagar have been using medicinal plants for curing various disorders. For them, these herbal remedies are less expensive. It is indeed true that the herbal medicines are harmless, easy to access, eco-friendly and cheaper. In the present communication, we aim to focus upon a practice for curing thyroid problem. Approximately 11 medicinal plants species of medicinal uses belonging to 10 families were recorded. These plants are enumerated as per Bentham and Hookers classification system reflecting the information of botanical name, local name, family, parts used and medicinal uses.

Keywords: Thyroid, hypothyroidism, hyperthyroidism and rural communities of Ambedkar Nagar.

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Introduction

India has a very rich biodiversity, unique physical and ethnic diversity, traditional culture and much indigenous knowledge or tribal wisdom (Rao 1989, 1994). There are 400 tribal and other ethnic groups in India constitute about about 7.5 % of India's population. Besides them, forest dwellers and rural communities also possess unique knowledge about plants (Jain 1991). One of the survey conducted by the WHO reports that more than 80% of the world's population still depends upon the traditional medicines for various diseases. In the developed countries 25 % of the medicinal drugs are based on plants and their derivatives and the use of medicinal plant is well known among the indigenous people in rural areas of many developing countries (Fabricant and Farnsworth, 2001; Perumal et. al. 2008).

The thyroid gland or simply, the thyroid in vertebrate anatomy is one of the largest endocrine glands. The thyroid gland is found in the neck, below the thyroid cartilage (which forms the laryngeal prominence "Adam's apple "). The thyroid gland controls how quickly the body uses energy, makes proteins and controls how sensitive the body is to other hormones. It participates in these processes by producing thyroid hormones, the principal ones being tri-iodothyronine (T3) and thyroxine which can sometimes be referred to as tetra-iodothyronine (T4). These hormone regulate the growth and rate of function of many other systems in the body. T3 and T4 are synthesized from iodine and tryosine. The thyroid also produces calcitonin which plays a role in calcium homeostasis.

Perusal of literatures on ethnobotanical plants of Chitrakoot region of M.P. (Sikarwar et. al. 2008, Tripathi and Sikarwar , 2013), revealed that there is no any information recorded on ethnomedicinal plants of district Ambedkar Nagar of Uttar Pradesh to cure Thyroid problem . Therefore, this has been recorded for the first time by author and described here.

Functional disorders:

Imbalance in production of thyroid hormones arises from dysfunction of the thyroid gland itself, the pituitary gland which produces thyroid stimulating hormone (TSH). Concentrations of TSH increase with age, requiring age corrected tests (Surks and Hollowell 2007). Hypothyroidism affects between 3 & 10% of adults with incidence higher in women and the elderly Villar et. al. 2007, Fatourechi 2009 and Gharibet et.al. 2009) .

Types of thyroid disorders: Thyroid disorder include
1: Hyperthyroidism (abnormally increased activity).
2: Hypothyroidism (abnormally decreased activity).
3: Thyroiditis (inflammation of the thyroid).
4: Thyroid nodules, which are generally benign thyroid neoplasms (tumours) but may be thyroid cancers.

All these disorders may give rise to a goiter that is an enlarged thyroid.

Causes of thyroid problems: When the body cannot get enough iodine, a goiter forms, which impairs thyroid function, causing hypothyroidism. Feeding goitrogenic foods as a significant part of diet, human and iguana, can thus lead to hypothyroidism. This leads to reduced activity levels, reduced metabolic rate, muscles and joints aches, pains and it also causes moderate to severe headaches , vision problems and hair loss as well as a host of other systems.

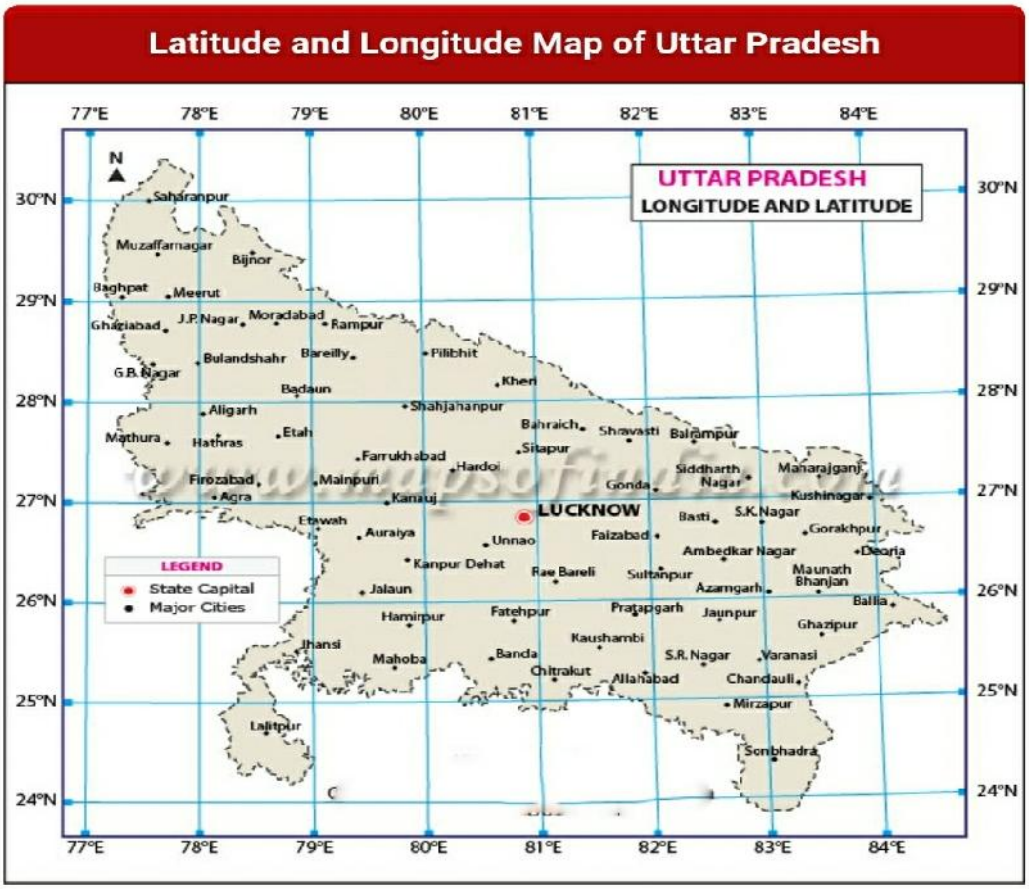
Hyperthyroidism or overactive thyroid is due to the over production of the thyroid hormones T3 and T4 , which is most commonly caused by the development of Graves disease an autoimmune disease in which antibodies are produced which stimulate the thyroid to secrete excessive quantities of thyroid hormones. It present with symptoms such as thyroid goiter protruding eyes (exophthalmos), palpitations, excess of sweating, diarrhoea, weight loss, muscles weakness and unusual sensitivity to heat.

Materials and Methods

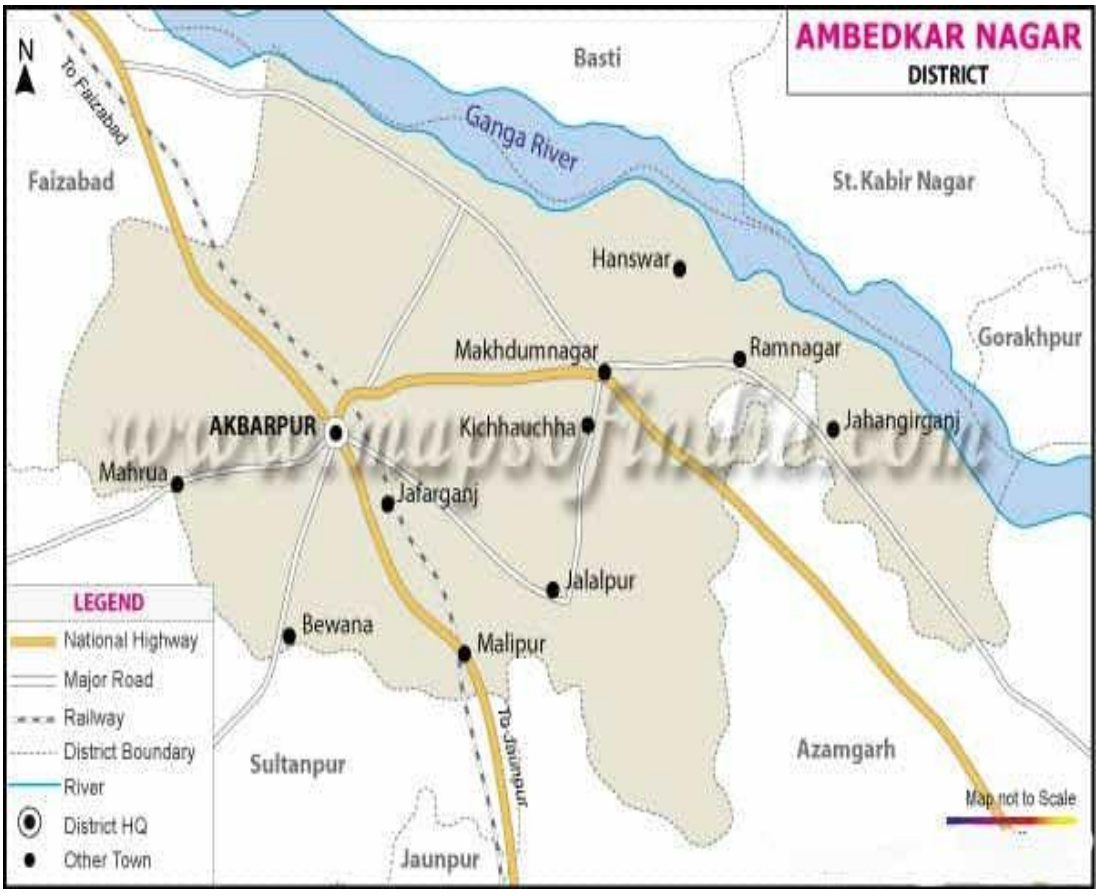
The study was conducted in rural area of district Ambedkar Nagar. District Ambedkar Nagar is lies between 26° 09' N to 26° 40' N latitude and 82°12' E to 83°05' E longitude .District Ambedkar Nagar is bound on the north by Basti and SantKabir Nagar district,on the north-east by Gorakhpur district,on the south by Sultanpur district ,on the west by Faizabad district,on the east by Azamgarh district and the south-east by Shahganj tehsil of Jaunpur district.The total area of the district is 2,520 km^2. The total length of the district from east to west is approximately 75 km and the breadth from north to south is about 42 km. This district belongs to Hindi belt of (U.P.), India. Ambedkar Nagar district population is 2, 39788 and divided in to 09 blocks, 5 tehsils and 1757 villages (Map-1, 2 & 3).

An ethnobotanical survey was carried out among the rural communities of Ambedkar Nagar district during different seasons of May 2019 to January 2021. The present study is based on the survey and collection of the data from the native informants like Vaidhya, Hakims and local people who have knowledge about the uses of medicinal plants with their botanical name, local name, family, part used and medicinal uses are described in detail. Herbarium specimens prepared following the standard method (Jain and Rao 1978) have been deposited in the herbarium and Plants have been identified in Plant Pathology Lab, Dr. Ashok Kumar Smarak P.G.College Akbarpur, Ambedkar Nagar (U.P.), India and the specimens have been identified using relevant floras and standard literatures (Hooker 1989, Gaur 1999, Yadav and Patel 2001 and Singh and Singh, 2009).

Map 1: Location of study area in India.



Map 2: Location of study area in Uttar Pradesh, India



Map: 3 -Location of study area in district Ambedkar Nagar

Medicinal plants observation

The plants species were enumerated with its botanical name, local name, family, part used and mode of intake and use. The plant species have been arranged alphabetically on the basis of their botanical name -

1: *Aegle marmelos* L.Corr.

Local name: Bael
Family: Rutaceae
Part used Leaves

Medicinal uses: Leaves an infusion of leaves of bael given half cup thrice a day for 7 - 10 days in the treatment of hyperthyroidism.

2: *Aloe barbadensis* Mill.

Local name: Gheekwar/ Aloe vera
Family: Liliaceae
Part used: Leaves

Medicinal uses: An infusion of leaves of *Aloe vera* is given twice a day in the treatment of hyperthyroidism.

3: *Avena sativa* L.

Local name: Jai/ Javi
Family: Poaceae
Part used: young seeds

Medicinal uses: Green oats used as food that contains minerals and vitamins B that support general health as well as aiding in thyroid function.

4: *Bacopa monnieri* L. Pennell.

Local name: Brahmi
Family: Scrophulariaceae
Part used: Leaves

Medicinal uses: An infusion of leaves of Brahmi is given half cup twice a day for 7 - 10 days in the treatment of hypothyroidism.

5: *Brassica oleracea* L.Var.*botrytis* L.

Local name: Phulgobhi
Family: Brassicaceae
Part used: Vegetative inflorescence

Medicinal uses: This cruciferous vegetable can potentially be goitrogenic (including goiter formation). They contain enzymes that interfere with the formation of thyroid hormone in people with iodine deficiency (Mc Dougall 2005 and Shomon 2009). Cooking for 30 minutes significantly reduces the amount of goitrogens and nitriles. At high intake of crucifers, the goitrogens inhibit the incorporation of iodine in to thyroid hormone and also the transfer of iodine in to milk by the mammary gland (Masterjohn 2008).

6: *Brassica oleracea* L. Var . *capitata* L.

Local name: Paat gobhi /Band gobhi
Family: Brassicaceae
Part used: Leaves

Medicinal uses: This vegetable can potentially be goitrogenic (inducing goiter formation). They contain enzymes that interfere with the formation of thyroid hormone in people with iodine deficiency. (McDougall 2005 and Shomon 2009). Cooking for 30 minutes significantly reduces the amount of goitrogens inhibit the incorporation of iodine in to thyroid hormone and also the transfer of iodine in to milk by the mammary gland (Masterjohn 2008).

7: *Linum usitatissimum* L.

Local name: Alsi
Family: Linaceae
Part used: Seeds

Medicinal uses: Flax seeds are good for thyroid health. Flax seeds helps in boosting the production of thyroid hormones. This results to reduced susceptibility to hypothyroidism.

8: *Morus alba* L.

Local name: Shahtoot
Family: Moraceae
Part used: Leaf

Medicinal uses: About 100 g. leaf and 5 g. Kali Mirch are ground together with the required quantity of water and filtered. One or two teaspoonful of the preparation is administered orally thrice a day for 2 to 6 months to cure goiter.

9: *Pistia stratiotes* L.

Local name: Jalkumbhi
Family: Araceae
Part used: Leaves

Medicinal uses: A wide spread weed in ponds, lakes is applied in paste form topically to reduce the swelling of thyroid.

10: *Withania somnifera* L.

Local name: Ashwagandha
Family: Solanaceae
Part used: Roots

Medicinal uses: An aqueous extract of dried Ashwagandha root is given daily for 20 days in the treatment of hypothyroidism.

11: *Zingiber officinale* (Rpsc.)

Local name: Adrak
Family: Zingiberaceae
Part used: Rhizome

Medicinal uses: About two table spoon dried powder should be given to the patient twice daily with lukewarm water for hypothyroidism.

Results and Discussion

During ethnobotanical survey of Ambedkar Nagar district (U.P.), India 11 medicinal plants belonging to 10 families and were recorded as effective remedies used by the rural peoples to treat the thyroid problem . In present investigation we have observed that 9 plants are useful to cure hypothyroidism where as 2 plants in hyperthyroidism The present study revealed that the folk medicine is very important aspect of medical anthropology and is rightly attracting. The use of plants to cure diseases and relieve physical sufferings has started from the earliest times of mankind's history (Hill 1989).

Now a days, the use of plants as a way of treatment is still very important for human beings (Kultur 2007). Thyroid disease is common and it is frequently treated by herbal medicine or a combination of herbs and drugs. Many modern medicinal therapies and medicines are available for the treatment of this disease but these methods are costly, non-affordable by the poor section and the re-occurrence rate is also high. The safest and cheapest remedy for the treatment includes the use of medicinal plants. It is very important to show an interest in indigenous system of medicines and traditional herbal remedies which are regarded as quite safe with no side effects and should be cost effective, readily available and easily affordable.

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