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CEDAR WOOD OIL – INDIGENOUS METHOD OF EXTRACTION AND ETHNOMEDICINAL USES BY THE GADDI TRIBE OF BHADERWAH VALLEY, JAMMU AND KASHMIR (NORTH WEST HIMALAYAS)

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ABSTRACT
Tribals are known as the torch bearers of ethnobotany. The present study was carried out in a Gaddi inhabited village viz. Dhamunda of Tehsil Bhaderwah. Gaddis have devised a unique low cost and eco-friendly indigenous method of extraction of cedar wood oil by heating small pieces of finely split wood of Cedrus deodara in an earthen pitcher. Gaddis of Bhaderwah traditionally use cedar wood oil as a crude medicine for treatment of different human and cattle diseases. Several studies have shown that Cedrus deodara oil exhibit high antimicrobial activity and medicinal properties. Integrating this indigenous wisdom with modern technology could enhance oil yield, improve safety, and promote sustainable livelihoods for tribal communities.

KEY WORDS: *Arthritis, Cedrus Deodara, Ethnobotanical, Himalayan.*

INTRODUCTION
Human reliance on nature to fulfill their varied needs can be traced back to prehistoric times (Choudhary et al., 2008). Indigenous societies worldwide possess extensive knowledge of using plants traditionally to meet various needs such as food, medicine, tools, artifacts, construction materials etc. (Kumar et al., 2015). The Gaddi tribe is a semi-nomadic Himalayan pastoral tribe inhabiting the mountainous regions of the Jammu & Kashmir. This tribe primarily engages in shepherding and maintains a close relationship with forests and forest resources (Singh et al., 2021). Due to limited access to modern healthcare services, tribal and rural populations depend largely on locally available medicinal plants to treat various ailments and diseases (Arya et al., 2014). Over centuries of observation and experimentation, often involving considerable risk, tribal communities have developed rich indigenous knowledge systems for the use of medicinal plants in promoting health and well-being (Kaya et al., 2020). The shift from traditional healing practices to scientifically developed modern medicine occurred gradually over several centuries (Subitha, 2012). Ethnobotanical studies serve as a foundation for future scientific research, offering valuable insights and clues that have contributed to the discovery of numerous plant-derived drugs (Anyinam, 1995; Pandey & Tripathi, 2017). It is estimated that nearly 40% of the pharmaceutical products originate from natural sources (WHO, 2022). Tribal communities possess extensive knowledge regarding the use of various ethnobotanical plants, many of which remain unknown to the mainstream society. This traditional wisdom, preserved within tribal societies, holds great potential for sustainable and commercial utilization for the benefit of humanity. The present study was carried out with the objective of documenting the indigenous method of extraction of cedar wood oil by the *Gaddi* tribe of Bhaderwah. This oil has long been used by the Gaddi people to treat a range of human and livestock ailments. Several previous research studies have demonstrated that Cedar wood oil possesses strong antimicrobial and medicinal properties (Zaman et al., 2018).

II. MATERIALs AND METHODS
Gaddis have devised a unique indigenous method of extraction of cedar wood oil by heating small pieces of finely split wood of *Cedrus deodara* in an earthen pitcher with a hole at its bottom (Fig. 1). The central older part of the tree trunk of *Cedrus deodara* which is darker in colour represents heartwood. The heartwood of *Cedrus deodara*, also called aromatic cedarwood, is rich in resin, tannins and oils and is highly inflammable and fragrant due to high volatile oil content. The oleoresinous heartwood of *Cedrus deodara* is finely split into thin pieces, locally known as *jangni*. The small pieces of finely split cedar wood are placed in an earthen pitcher with a small hole at its bottom. The main opening of the pitcher is covered with a lid. A small metal container is kept in a pit in the soil and the pitcher is then placed over it. The outer surface of the pitcher is coated with a thick layer of mud and the pitcher is surrounded by fuel wood, which is set on fire. The heat thus generated results in extraction of cedar wood oil from the cedar wood in earthen pitcher which pours down into the metal container from the pitcher through the hole at its bottom.

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a) Metal container placed in a pit in the soil



b) An earthen pitcher with a small hole at its bottom



c) Earthen pitcher placed over the metal container



d) Resinous fuelwood of *Cedrus deodara* placed inside the earthen pitcher



e) Opening of the pitcher covered with a lid



f) The fuel wood surrounding the pitcher is set on fire.

Fig. 1(a – f): Indigenous method of extraction of cedar wood oil by the Gaddi tribe.

III. RESULTS AND DISCUSSION

Gaddis of Jammu and Kashmir live in and around the forests and are highly knowledgeable about traditional use of local plants. They live in complete harmony with the nature without disturbing ecological balance. Gaddis have developed an eco-friencdly, cost effective and indigenous method of extraction of cedar wood oil from oleoresinous heartwood of *Cedrus deodara.* Gaddis of the study area use cedar wood oil for treatment of human diseases as well as cattle diseases. The findings of the present study reveal that gargles with warm cedar wood oil are helps in maintaining oral and dental health as it provides protection against germs and makes gums and teeth strong. A small piece of cloth or cotton, soaked in hot wood oil, is tied over the joints to get relief from arthritis pain Cedar wood oil mixed with mustard oil is applied locally in case of scabies and itch and skin boils. Cedar wood oil is applied externally for healing infected wounds, locally known as *barm.* he Gaddi tribe traditionally uses cedarwood oil in ethnoveterinary practices for purposes such as deworming, enhancing digestion, stimulating appetite and treating mange disease in goats and sheep. It is mixed with salt and administered orally to lambs to curb their habit of consuming soil. Several previous studies carried out in Jammu and Kashmir have revealed the medicinal importance of cedar wood oil. Cedar wood oil is used in case of fever, headache, dysentery, diarrhoea, pulmonary disorder, skin diseases, itching, skin rashes, skin allergies, ulcers & piles, arthritis, wounds, external ulcers, burning sensation of soles, herpes, to kill lice (Lone et al,. 2012; 2-Rashid, 2012; Rashid, 2013; Bhat et al., 2014; Kumar et al., 2015; Riaz & Bhandari, 2015

CONCLUSION

The indigenous method of cedar wood oil extraction practiced by the Gaddi tribes is a sustainable and culturally rooted approach to resource utilization. They developed this traditional knowledge through experience and observance for several generations, which allows efficient extraction of valuable oil from wood of *Cedrus deodara* without disturbing the ecological balance. The process depends on locally available materials, minimal energy inputs, and environment friendly techniques, demonstrating an inherent understanding of conservation of nature and natural resources. Documenting such traditional practices not only helps preserve cultural heritage but also offers valuable insights for developing low cost, eco-friendly alternatives to industrial extraction methods. Integrating this indigenous wisdom with modern technology could enhance oil yield, improve safety, and promote sustainable livelihoods for tribal communities.

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