12 - Enhancement of photoluminescence/phosphorescence properties of Eu^{3+}-doped $Gd_2Zr_2O_7$ phosphor

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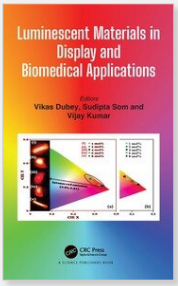

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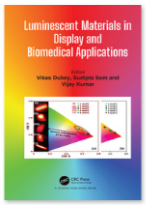
Phosphors for Display, Forensic and Biomedical Applications

Vikas Dubey
Marta Michalska-Domańska
Neha Dubey
Jagjeet Kaur Saluja
Editors

NOVA



Chapter

Phosphors in Role of Magnetic Resonance, Medical Imaging and Drug Delivery Applications: A Review

By Neha Dubey, Vikas Dubey, Jagjeet Kaur, Dhananjay Kumar Deshmukh, K.V.R. Murthy

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Chapter 6

Tin-Based Materials for Sodium-Ion Batteries

Bhawana Jain[a], Ajaya K. Singh[a*], Md. Abu Bin Hasan Susan[b]

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Abstract

Due to intermittent behavior, renewable energy sources can be used for storage of sustainable electrical energy in stationary devices. Sodium ion batteries have the bright prospect for energy storage from economic point of view because of its high abundance in nature. But batteries of this kind are associated with lower energy density, which moves scientist back to Li-ion batteries. However, sodium ion batteries (NaIBs) with Sn as advanced anode material may be more suitable for energy storage with high cycling capacity and negligible capacity loss. Anode material of NaIBs highly affects the basic characteristics of such devices such as cycling effect, capacity etc. In this account, we deliberate recent developments in Sn based anode material of NaIBs. We have highlighted the role of Sn as anode along with the mechanism. We focused and discussed in detail Sn-alloys which offer highest reported capacities albeit some challenges and solution.

Keywords

Na-Ion Batteries, Sn-Anode, Types of Sn-Based Anode, Mechanism, Performance

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Quantum Dots – Properties and Applications
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Chapter 2

Fabrication Techniques for Quantum Dots

Jyoti Patel, Bhawana Jain, Ajaya Kumar Singh*

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Abstract

The nanotechnological expansion involves the innovation and designing of materials at the nanoscale regime with controlled properties. Production of nanomaterials with good crystallinity, shape control, and narrow distribution of size plays a significant role in QD-based devices and applications. Various strategies ranging from simple wet chemical methods to advanced atomic layer deposition strategies have been employed for the production of QDs. In this chapter, a prominent and detailed discussion of conventional techniques in addition to the up-to-date development in the synthesis of recent QDs is given. Synthesis routes based on the microwave or ultrasonically assisted and cluster-seed process are of great significance.

Keywords

Quantum Dots, Lithography, Etching, Microemulsion, Epitaxy, Ultrasonic, Microwave, Hydrothermal, Solvothermal

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Chapter 4
Plastics and e-Waste, a Threat to Water Systems

Bhawana Jain, Ajaya K. Singh, and Md. Abu Bin Hasan Susan

Contents

Abstract Plastics and e-waste are major emerging problems in developed and developing countries around the globe. Annual production of plastics is 300 million metric tonnes and that of electronics goods is 50 million tonnes in the world. As per latest survey, it is estimated that approximately 8.3 billion tonnes of plastic has been produced since the early 1950s. About 60% of that plastic has ended up in either a landfill or the natural environment. Accumulation of plastics and electronic plastics in environment generally occurs by release of small particles from our daily chores, that is, use of cosmetics, textile fabrics, carry bag, disposal utensils, bottled water, mobiles, electronic gazettes, television, refrigerator, etc. Every bit of plastics and e-waste ever made will always remain and pollute the environment. We reviewed the overall scenario, which comprises a multitude of components with valuable materials, some containing toxic substances that can have an adverse impact on human health. Pollutants of this kind can affect the land, water, and air. Microplastics and e-wastes are extensively distributed in both fresh and sea water system. Once mixed

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Bottled and Packaged Water
Volume 4: The Science of Beverages
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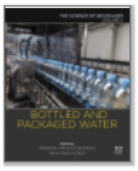

2 - The World Around Bottled Water

Bhawana Jain *, Ajaya K. Singh *, Md. Abu Bin Hasan Susan †

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Abstract

Water, the most important substance in our evolution, is an integral part of the human life and health in particular. The devoid of water makes life impossible and next to air, it is the most indispensable thing. A man can survive for a month

next to air, it is the most indispensable thing. A man can survive for a month without food but cannot live even for 10 days without water. Every day we have to drink; the amount of drinking water required, however, is variable and depends on individuals, their physical condition, life cycle, and the climate. To ensure a healthier life, it is imperative to drink water that is safe to drink. Soft drinks and beverages, in particular, sugar-sweetened beverages became popular. But health concerns from the use of such sugary beverages have shifted the bias to bottled water. As the name implies, bottled water is a drinking water, packaged in either plastic or glass containers without any added sweetener. In consideration of the today's life style, bottled water rendered it as a smart and healthy choice among other drinks. Bottled water is, however, not proven to be better than tap water under normal conditions. Rather, manufacture of bottled water may increase CO_2 level of the environment. To ease the contamination of tap water in case of poor supply and the emergencies during natural disaster, bottled water has evolved as the best option.

Water is packaged mainly in polyethylene terephthalate (PET) bottles, which is 100% recyclable. The bottled water industries strongly support recycling of plastic bottles but due to unawareness among public, only a small fraction of the total bottles are recycled and the rest is dumped either in land or water, which create several environmental issues. Energy consumption during the manufacturing of bottles and their packaging, transportation are also important factors to be considered to avoid environmental risks. Extensive use of bottled water may be avoided to move a

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Biosurfactants for the Bioremediation of Polluted Environments

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Chapter 14 - Application of biosurfactant during the process of biostimulation for effective bioremediation of a contaminated environment

S. Sreevidya [a], Kirtana Sankara Subramanian [b], Yokraj Katre [a], Ajaya Kumar Singh [c]

https://doi.org/10.1016/B978-0-12-822696-4.00003-6

Abstract

Mankind has potentially exploited the geological components of nature by hoarding its elements. The financial prominence of the world's nations are implicitly influenced by the valuable potential reserves they may contain. Technological evolution in industrialization and its symbiotic utilization many times has led to an ecological imbalance in nature. As we are presently living in the midst of a global pandemic, the protection of nature should be our most important goal.

The overlapping fields of geology, mining, geochemistry, soil sciences, hydrology, ecology, biotechnology, and microbiology with environmental toxicology facilitate the demand for conceptualizing and developing new models for bioremediation and biostimulation. The aforesaid interdisciplinary reinforcement delivers a remarkable solution to resolve the complexities of safeguarding the Earth by biostimulated, bioremediation philosophies aided by natural biosurfactants. Biological intercepts explore and utilize microbial communities using their biochemical components to offload environmental contaminants.

Functionalized Nanomaterials for Catalytic Application

Chapter 1

Functionalized Nanomaterial (FNM)–Based Catalytic Materials for Water Resources

S. SreevidyaKirtana Sankara SubramanianYokraj KatreAjaya Kumar SinghJai Singh ✉

Book Editor(s):Chaudhery Mustansar HussainSudheesh K. ShuklaBindu Mangla

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Summary

Water, one of the essential elements in the nature under a great threat, with pollutants treasured in it generates noxious suffocations with the raise in contaminants globally. It is time we wake up. Fabrication of innovative nanomaterials with unique models and approaches, deliver versatilities in overcoming the drawbacks installed in earlier protocols for a full-scale utilisation in the environmental pitch. Functionalization of nanoscales provides a promising note, when employed in remediation applicational functions for environmental system. Protection of as-synthesized nano scaled material by casing a suitable layer of organics/inorganics on their core surface by functionalization modules enhances the functionalities.

Functionalized nanomaterials supported with nanocatalyst have been proven for their high selectivity and controlled sensitivity over the target samples in water management. Nano-adsorbents, nano-membranes and nanocatalysts are commendably employed for attacking and eliminating the pollutant from the resourceful water sectors either in surface or in sub-surface. Functionalized nanocatalysts like electrocatalyst, photocatalyst, electro-Fenton catalyst, Fenton-based catalyst, and oxidants (chemical) by versatile processes have revealed their potentialities in getting rid of biological, organic and/or inorganic toxicants from water bodies that might lead to painful health issues. Functionalized nanocatalytic materials for remediation of water resources will be mainly focused in the segments to come.

Chapter

Nanomaterials for Environmental Hazard

Analysis, Monitoring, and Removal

By S. Sreevidya, Kirtana Sankara Subramanian, Yokraj Katre, Ajaya Kumar Singh

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Pharmacological Significance of Andrographis paniculata

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Pharmacological Significance of *Andrographis paniculata*

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Chapter - 4

Pharmacological Significance of *Andrographis paniculata*

Anil Kumar and Rajeshwari Prabha Lahare

Abstract

Andrographis paniculata is an important medicinal plant of Acanthaceae family and has widely known for its pharmacological applications in Homeopathic, Ayurvedic, Chinese, Unani and traditional systems of medicines. The plant is commercially grown throughout the world such as India, Pakistan, Shri Lanka, China, South Asia and South Africa due to its high demand in industries for medicinal purposes. Terpenoids and flavonoids are the main phytoconstituents of the plant found mainly in leaves and roots parts. Plant is well known for its vast pharmacological properties such as anti-malarial, immune stimulatory, anti-diarrheal, anti-thrombotic, anti-diabetic, anti-pyretic, anti-hyperlipidemic, anti-venom, antiprotozoal, anti-viral, anti-oxidant, cardio-protective, gastro-protective, analgesic, anti-cancer, anti-fungal, anti-HIV, anti-diarrheal, and anti-hypertensive activities. The main objective of present chapter is to sum up its pharmacological potential, traditional knowledge and clinical studies of plant.

Keywords: *Andrographis paniculata*, Acanthaceae, pharmacological applications, terpenoids, flavonoids

1. Introduction

Medicinal plants and plant derived drugs are the alternative medicine and extensively used for centuries to cure various ailments. Around the world about 80,000 plant species have been identified and used as medicinal plant [1]. In modern times plants play significant role and belief is that they have vast potential for treatment of diseases and they are supposed to be safe in use, effective, and simple with no or lesser side effects. *Andrographis paniculata* (Burm. f.) Nees is a multipurpose medicinal plant belonging to family Acanthaceae [2]. The whole parts of plant are bitter in taste and due to its bitterness property, it is commonly known as “King of Bitter”. The other vernacular names of the plant include Kalmegh, Kirayat, Bhui neem,

Chirata, Mahatikta, Hempedu Bumi, Vubati, Chiorta, Nilavembu, etc. In tropical Asian countries the genus *Andrographis* contains 28 species [3] whereas in India it contains 21 species in which *Andrographis paniculata* was one of them [4]. It has been reported that the plant is grown in different habitats e.g. dry and wet lands, plains, slopes, waste lands, sea shores, and hill slopes [5]. It is a kharif crop cultivated in the rainy phase of summer season. The crop is commercially cultivated in all types of soil having fair amount of organic matter [2] and having high demand in terms of pharmaceutical industries, nutritional values, food supplements, food preservatives and it also promotes growth and health of livestock. It has been reported that the plant is beneficial for removal of toxins from the body, lowering body temperature, prevent respiratory infections and also act as antidote against poison [6]. Traditionally in Asian countries the plant is used as immune booster to treat fever, herpes, sore throat, and infections in gastrointestinal and respiratory tract as reported by Wangboonskul *et al.* [7] In Asia and Europe the whole plant, leaves and roots were used for folklore remedy [8]. The WHO has noticed that the herb *Andrographis paniculata* is widely used in Asia for cure of fever, herpes, diarrhea, inflammation, respiratory infection, throat sour, and various other infections [9]. According to Unani system of medicine, the plant is regarded as emollient, aperient, anti-inflammatory, astringent, carminative, diuretic, gastric and liver tonic, anthelmintic [10]. Flowering of plant begins with the onset of monsoon; plant grows with moderate temperature after the end of monsoon. During flowering andrographolide the active compound is highly accumulated in leaves. During monsoon season the crop yields 3.5 to 4 tones/ha of dried plant. It has been reported that highest concentration of andrographolide was found in the sample harvested after 110 days of cultivation followed by that just before flowering stage (130 days) [11]. Highest yield of diterpenoid lactones was obtained in the plant at 110-120 days old just before the blooming season [12, 2]. It has been reported that *Andrographis* contributes several species such as *A. paniculata, A. beddomei, A. elongata, A. echioides, A. affinis, A. alata, A. glandulosa, A. lineata, A. ovata and A. serpyllifolia* among these species only few having medicinal values used extensively in Naturopathy, Ayurveda, Homeopathy, Amchi, Modern, Unani and Siddha medicine systems [13].

2. Taxonomy of the plant

Kingdom: Plantae, Plants

Sub Kingdom: Tracheobionta, Vascular plants

Super Division: Spermatophyta, Seed plants

Division: Angiosperms

Class: Dicotyledonae

Sub class: Gamopetalae

Series: Bicarpellate

Order: Personales

Tribe: Justicia

Family: Acanthaceae

Genus: Andrographis

Species: *Andrographis paniculata* (*Burm. f*) Nees [2]

3. Geographical distribution

The plant is distributed widely in different edaphic zones and phyto geographical regions of America, China, West Indies and Christmas Island [14]. It is distributed in Southern and South eastern Asian including India, Sri Lanka, Java, Indonesia Pakistan and widely cultivated in India, Brunei, Thailand, Indonesia, China, West Indies such as Jamaica, Barbados and Bahamas, Hong Kong and the South Western Nigeria and America [2]. Alagesaboopathi[15] reported that in India the plant cultivated widely in plains of all-over South India and from Himachal Pradesh to Assam and Mizoram at altitudes ranging from 10m to 1400m. The *Andrographis* species known as "Periyanagai" such as *A. alata* (Vahl) Nees, *A. lineate* wallich ex Nees, *A. echioides* Nees are grown widely in South West India, Tamil Nadu, Kerala, Andhra Pradesh and Sri Lanka at altitudes from 1025 m to 2500m. In India the plant is found in the states of Chhattisgarh, Orissa, Bihar, Madhya Pradesh, Maharashtra, Assam, West Bengal, Tamil Nadu, Uttar Pradesh, Kerala, and Karnataka. In Madhya Pradesh Balaghat district the whole parts of the plant is used in treatment of malaria and chikungunya [16].

4. Morphology

Andrographis paniculata (Acanthaceae family) is annual, erect, branched, herbaceous dicotyledonous flowering plant and distributed mostly in moist, shady areas with at a height of 30-110cm. The leaves of the plant are 2-12cm long, 1-3cm width having entire margin, simple glabrous, arrangement of leaves is lanceolate and shape is acute, pinnate apex with entire margin. Flowers are perfect, zygomorphic, bracts, white in color with rose purple spot on the petals and inflorescence is 10-30mm long panicle is

terminal and axillaries with small bract and short pedicle. The flowers having 5 sepals, corolla tubes are narrow white with yellow top, about 6 mm long, stamens 2, ovary superior with style exerted. Seed are yellowish brown in color, shape is sub quadrate, numerous and capsule of the herb is linear-oblong, acute at both ends, size is 1.9cm × 0.3cm erect, 1-2 cm long and seeds are very small. Flowering and fruiting period of the plant is December to April [17]. The total chromosome number in *A. paniculata* is 25 in gametophytic and 50 in sporophyte count [18] (Fig1) represents *A. paniculata.*

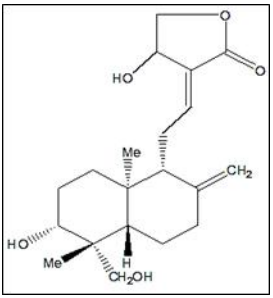
Fig 1: Picture showing *Andrographis paniculata*

5. Phytoconstituents

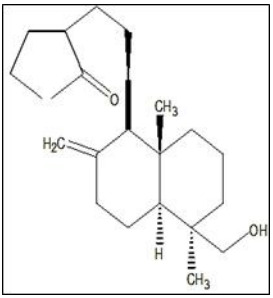
Several secondary metabolites are present in *Andrographis paniculata* such as terpenoids, flavonoids, steroids, alkaloids, tannins, cardiac glycoside, phenol and saponin compounds which exhibits broad range of pharmacological properties. Duke [19] reported presence of alkaloids, flavonoids, tannins, and phenolic compounds in *A. paniculata*. Chen and Jiang [20] reported presence of flavones, lactones and andrographolide in aqueous extract of *A. paniculata.* Andrographolide is a major labdane diterpenoid constituents of *A. paniculata* and isolated first time by Gorter [21] in its pure form and characterize by x-ray crystallographic method. It has been reported that andrographolide has a-alkylidene and y-butyrolactone, two olefin bonds at C-8 and C-12 and three -OH at C-3, C-19 and C-14 [22]. Andrographolide is trihydroxy lactone has the molecular formula of $C_{20}H_{30}O_5$ exhibits anti-inflammatory activity [23]. The melting point of andrographolide is 228-230 ºC and the ultraviolet spectrum λ max in ethanol is 223 nm. Fujita *et al.* [24] isolated neoandrographolide, andrographolide, 14-deoxyandrographolide and three diterpenoids which were andropanoside, andrograpanin, 14-deoxy-12-methoxyandrographolide. The plant contains 12-deoxyandrographolide, neoandrographolide, and andrographanin andrographinnes A, B, C, D & E [25]. Thin layer chromatography and column

chromatography was used to isolate four xanthones (3, 7, 8-trimethoxy-1-hydroxy-xanthone 1, 8-dihydroxy-3, 7-dimethoxy-xanthone, 1,2-dihydroxy-6,8-dimethoxyxanthone and 4,8-dihydroxy-2,7-dimethoxy-xanthone) from the root part of the plant and were characterized by mass and nuclear magnetic resonance spectroscopic methods and infrared radiation [26]. Different solvents were used for extraction of bioactive compound such as hexane, acetone, acetone-water, methanol, ethanol, chloroform and dichloromethane from the aerial parts, whole plant, stems, leaves and roots. The compound andrographolide was found soluble in ethanol, methanol, acetic acid, pyridine, but slightly dissolved in ether and water. The plant contains more than 55 *Ent*-labdane diterpenoids, 8 quinic acids, 30 flavonoids, 4 xanthones and 5 noriridoids namely andrographidoids A, B, C, D, and E [27]. It has been reported that nearby 20 diterpenoids and 10 flavonoids have been reported from *A. paniculata* [28]. Studies suggested that in leaves andrographolide is present in high quantity where as in seeds it was found in low quantity [29]. The plant contains 4% of andrographolide ($C_{20}H_{30}O_5$) the major diterpenoid and its concentration in crude extract was found 0.8-1.2% and 0.5-6% [30]. Observation showed that the highest yield of diterpenoid lactones was obtained just before the blooming season or when the plant is 110-120 days old [2, 29]. *A. paniculata* contains glucosides; neoandrographolide, panaculoside, andrographolide, andrographonin, flavonoids, apigenin 7-4-dimethyl ether, panicalin, diterpenoids; 14-deoxy-11-oxo-andrographolide, 14-deoxyandrographolide, 14-deoxy-11, 12-didehydroandrograholide. The aerial parts of the plant contains several chemical compounds of medicinal importance *viz.* 5-hydroxy-7,8-dimethoxyflavone, β-sitosterol, glucoside, carcrol, myristic acids, chlorogenic, andrographolide, panicolide, eugenol, 5-hydroxy-7,8-dimethoxyflavone,5-hydroxy-3,7,8, 2'-tetramethoxy flavone, hentriacontane, dicaffeoylquinic acids, 7-o-methylwogonin, apigenin-7,4'-di-omethylether, tritriacontane, andrographiside, 3-14-dideoxyandrographolide, β19 oxide, β-hydroxy-8(17), 12-labadien-16, 15-olide-3 [31]. The five nori iridoids *viz.* andrographolide A-E along with curvifloruside was isolated from the roots of the plant [32]. It has been reported that the compound neoandrographolide showed anti-hepatotoxic and anti-inflammatory properties. 14-deoxy-11, 12-didehydroandrographo-lide and 14-deoxyandrographolide possess anti-hepatotoxic, immune stimulatory and anti-atherosclerotic activity. Two flavonoid compounds were isolated from the whole part of the plant 5, 7, 2', 3'-tetramethoxyflavanone and 5-hydroxy-7, 2', 3'-trimethoxyflavone and these active molecules of the plant exhibit various therapeutic property like anti-inflammatory, anti-cancerous, immune modulator, anti-hepatotoxic,

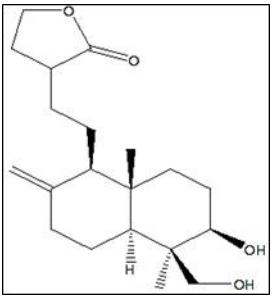
anti-atherosclerotic, anti-hyperglycemic, anti-infections effect and anti-oxidant [33]. The two main compound flavonoids and diterpenoids (which contain hydroxyl, α, β unsaturated-ϒ lactone, and exomethylene groups in their chemical structures) from *Andrographis paniculata* [34]. Fig 2 represents structures of bioactive components of the plant.



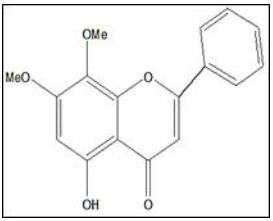
Andrographolide



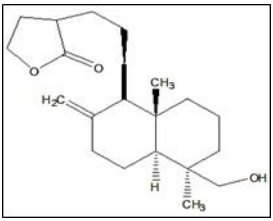
β- sterol



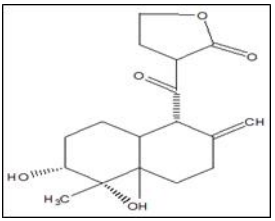
14-deoxyandrographolide



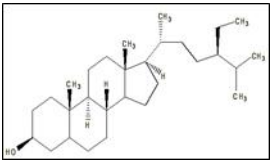
5-hydroxy7-8 dimethoxyflavones



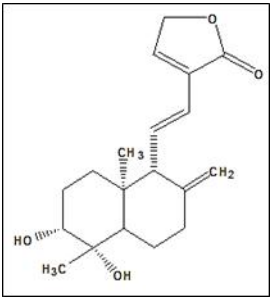
Andrographanin



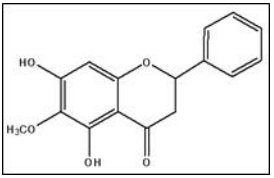
14-deoxy-11-oxoandrographolide



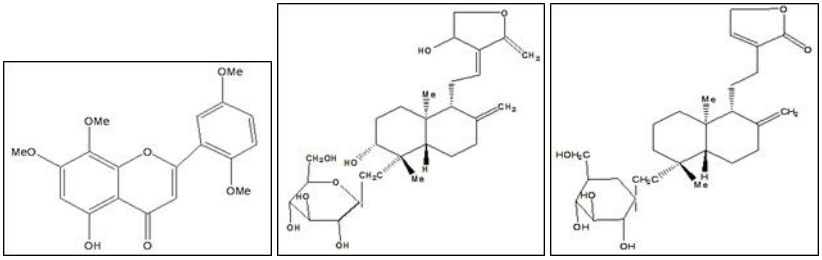
α-sitosterol



14-deoxy-11-12 didehydroandrographolide



Oroxylin A



5-hrdroxy -7, 8, 2', 3', tetramethoxy flavones **Andrographiside** **Andrographoneo**

Fig 2: Structures of some bioactive compounds from *Andrographis paniculata*

6. Biosynthesis of secondary metabolites

Secondary metabolites play important role as they are non-essential to growth and development of plant but contribute plant survival under adverse condition. The secondary metabolites have important ecological role e.g. in defense mechanism against predators and as sexual attractants for pollinating insects [35]. Secondary metabolites are classified into terpenoids, phenolics and alkaloids whereas tannins, glycoside and saponins are part of them according to their structure [36]. The most common pathways taken for biosynthesis of secondary metabolites are shikimic acid pathways for phenols, tannins and aromatic alkaloids, malonate pathways for phenols and alkaloids, pentose phosphate pathways for glycosides, polysaccharides and mevalonic acid for terpenes, steroids and alkaloids. The components used for biosynthesis of secondary metabolites are derived from acetyl CoA, mevalonic acid, shikimic acid and 1-deoxylulose-5-phosphate [37]. Terpenoids are polymeric isoprene derivatives and synthesized from acetate via mevalonic acid pathway and constitute large family of phytoconstituent. Methyl-D-erythritol 4-phosphate pathway (MEP) and Mevalonate Pathway (MVP) are the major pathway for the synthesis of a number of biological compounds [38]. The synthesis of andrographolide is increased by the exogenous use of (31.25%) Jasmonic acid *(JA)* and (56.1%) Gibberellic acid (GA3) [39].

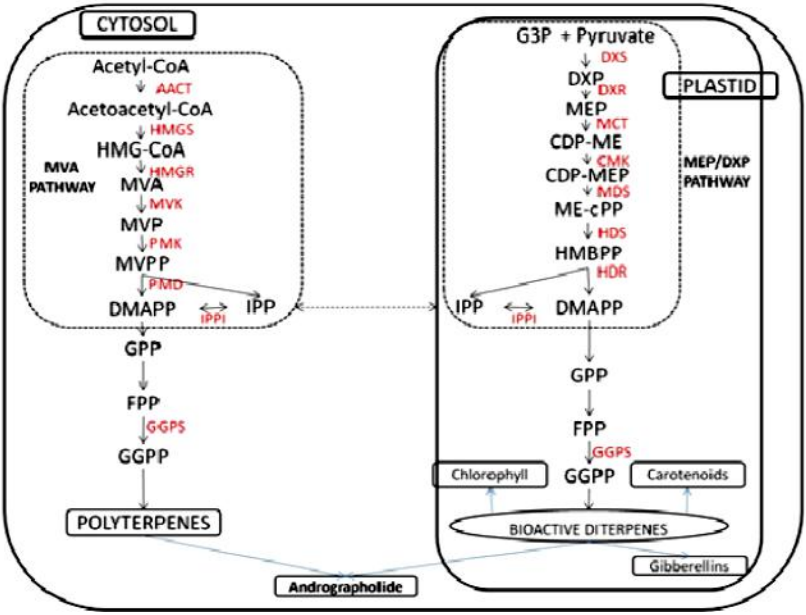


Fig 3: Biosynthetic pathway of terpene showing the production of the andrographolide Red color text shows the enzymes of respective product [39]

7. Pharmacological significance

Andrographis paniculata is well known for its pharmacological and biological activities. The leaves and roots of *A. paniculata* are generally used for medicinal purpose for the treatment of dysentery, convalescence after fever and gaseous distention [40, 41]. Tannins are biologically active against *Staphylococcus aureus*, *Salmonella paratyphi, E. coli,* and *Candida albicans* [42]. Flavonoids are known as nature biological response modifier because it modifies the body reaction to virus and allergies and showed their anti-inflammatory, anti-microbial, anti-allergic and anti-cancer activities[43]. It has been reported that to treat diseases like malaria, pain killers and managing heart diseases alkaloids are being used [44]. Glycosides are the non-volatile compound and lack fragrance, cleavage of glycosidic bond yields aglycone which is volatile and fragrant. It has been reported that glycosides are used in plant protection against insects, microorganisms and herbivores [45]. Steroids are the important compounds used as herbal medicines, nutrition and cosmetics. Plant steroids are important for their microbial activities. In pharmacy steroids are important due to their role in sex hormones [46]. Saponin is mild detergent used to stain intracellular histochemical and also used to allow antibody access in intracellular proteins. Antioxidant activity

of the plant is due to the presence of phenols which are low molecular weight secondary metabolites which comprises a largest group of phyto compounds [47]. The microbial growth should be inhibited at a low tannin concentration that acts as antifungal agent but at high concentration it coagulates protoplasm of microorganism [48]. Among the phytoconstituents, phenols showed anti-oxidant activity whereas flavonoids showed anti-allergic, anti-inflammatory, anti-microbial and anti-cancer activities [49]. Table 1 represents the phytocompounds of *A. paniculata* and their pharmacological properties.

Table 1: Phytoconstituents and pharmacological application of *A. paniculata*

Phytoconstituents	Biological activities
Andrographolide	Antibacterial [1, 53], Antioxidant [23], Antidiabetic [96, 94], Antipyretic [107, 138], Anticancer [129, 92, 137], Antiviral [65] Antihelmenthic [136], Anticancer [129, 84, 92], Antihepatitis C virus [135], Anti HIV [101], Antidiarrhoeal [133], Anti-inflammatory [80, 23, 86, 85], Hepatoprotective [102, 134], Antimalarial [69], Common cold [139], Cardiovascular [95], Antifertility [124], Antivenom [120].
14-deoxy andrographolide	Antipyretic [105, 131], Anti-inflammatory [80], Cardiovascular [108], Anticancer [129]
Neoandrographolide	Antioxidant [90], Anti-inflammatory [80], Antidiarrheal [133] Antipyretic [107], Antiviral [65], Hepatoprotective [132]
Deoxyandrographolide	Anti-inflammatory [80], Antipyretic [107]
Andrographiside	Hepatoprotective [103]
5-hydroxy-7,8-dimethoxy flavones	Antimalarial [69], Antiprotozoal [67, 52, 73, 74], Anti-HIV [100]
Dehydroandrographolide	Antipyretic
Andrograpanin	Anti-HIV [100]
1,2-dihydroxy-6,8-dimethoxy-xanthane	Anti-malarial [65]
Bis- andrographolide	Anti-HIV [100]
14-deoxy-11,12-didehydroandrographolide	Antiviral [65], Antipyretic [131], Anticancer [129], Cardiovascular [130, 108], Anti-HIV [100, 65].

Besides, some major pharmacological significance has been illustrated as follows---

7.1 Antibacterial activity

Nowadays, bacterial resistance becomes a serious problem so that it is necessary to search for new drugs as antibacterial agent. It has been reported that the natural products isolated from medicinal plants play the major source of antibacterial agent used for treatment of various disease [50]. Hexane, chloroform and methanol extract of *Andrographis paniculata* and

andrographolide showed antibacterial activity against both gram negative and gram-positive microorganism [51]. The ethanol extract of *A. paniculata* showed inhibitory activity against gram positive and gram-negative bacteria [52]. It has been studied that the ethanolic extract and andrographolide compound showed neither bacteriostatic nor bactericidal action against *Pseudomonas aeruginosa, Salmonella typhimurium, Escherichia coli, Shigella sonnei, Staphylococcus aureus, Streptococcus pneumoniae, Streptococcus pyogenes, Legionella pneumophila* but it exhibited bacteriostatic activity against *Legionella pneumophila* and *Bordetella pertussis* [53]. The extracts of *A. paniculata* showed antibacterial activity at different concentration *i.e.* 1000, 500, 250µg/disc against skin disease [54]. The ethanol leaf extract exhibits antibacterial activity against *Escherichia coli, Klebsiella pneumoniae, Proteus vulgaris* and *Streptococcus pneumonia* by using disc diffusion method [55]. Leaves and stems of *A. paniculata* extract isolated in petroleum ether, acetone, and chloroform and showed antimicrobial potential against *Enterococcus faecalis, Streptococcus pyogenes, Klebsiella pneumonia* and *Proteus vulgarism* [56]. The aqueous leaf extracts of *A. paniculata* possess antibacterial activity against gram positive bacteria *i.e. Bacillus subtilis* and *Streptococcus aureus* [57]. It has been investigated that the plant *A. paniculata* serves as an antimicrobial agent against pathogenic microorganism [58, 59, 60, 61].

7.2 Anti-malarial activity

Malaria is an endemic disease caused by *Plasmodium* a protozoon and widespread in tropical and sub-tropical countries affecting a large number of populations. Najib *et al.* [62] found that within 24 hours the growth of malaria parasite was reduced with 0.05mg/ml of chloroform extract of *Andrographis paniculata* whereas 2.5mg/ml of methanolic extract was used to inhibit the growth at 48 hours. It has been reported that 1-8-dihydroxy-3,7-dimethoxyxanthone,1,2,-dihydroxy-6,8-dimethoxyxanthone,4,8-dihydroxy-2,7-dimethoxy-xanthone and 3,7,8-trimethoxy-1-hydroxy-xanthon present in roots of *Andrographis paniculata* showed anti-malarial activity against *Plasmodium falciparum* and *Plasmodium berghei* [63]. Nowadays, *Plasmodium falciparum* acquires resistance against some of the commonly used anti-malarial drugs like mefloquine, chloroquine, mepacrine, primaquine, sulphadoxine, pyrimethamine [64]. Dua *et al.* [65] studied that (4µg) of 1, 2-dihydroxy-6,8-dimethoxy-xanthane obtained from *A. paniculata* showed anti-plasmodial activity against *P. falciparum*. The methanolic extract of *A. paniculata* was used to reduce the multiplication of *P. falciparum* [66]. The anti-malarial activity was observed against

Plasmodium berghei and *P. falciparum* due to the presence of antioxidant enzyme in the former and xanthones in the latter having potential for reactivation of superoxide dismutase in *A. paniculata* [67]. Goel *et al*. [68] have examined antiprotozoal activity against *Trypanosoma brucei, Trypanosoma cruzi* and *Leishmania infantum* from xanthones extracted from the roots of *A. paniculata* and did not found any promising effect up to pharmacological significance. It has been reported that andrographolide and 5-hydroxy-7, 8-dimethoxy flavones showed antimalarial activity against *Plasmodium berghei* and demonstrated that andrographolide (53.9±3.1%) showed better inhibition than 5-hydroxy-7, 8-dimethoxy flavones (15.4±2.9%) [69]. Due to reactivation of one of the key antioxidant enzyme superoxide dismutase, it has been reported that *P. berghei* the causative agent of malaria was inhibited by *A. paniculata* extract [70]. Studies suggested that *A. paniculata* showed antimalarial activity against *P. falciparum* [71]. *A. paniculata* along with *Goniothalamus scortechinii* and *Aralidium pinnatifidum* showed anti-malarial activity against *P. falciparum* as evaluated by lactate dehydrogenase assay whereas all the extracts exhibited the growth inhibitory action against malaria parasite [72]. Xanthones isolated from the roots of *A. paniculata* showed anti-malarial activity [73] and antiprotozoal activity against *T. brucei*, *T. cruzi* and *Leishmania infantum* [74].

7.3 Antioxidant activity

Free radicals are harmful for cells as they disturb the major metabolic pathways and damage cells and tissues. Antioxidant property of plant is attributed by high content of flavonoid and phenol. Andrographolide reduces the neutrophil count in rat by inducing the ROS production [23]. The aqueous, methanolic and ethanolic extract of *Andrographis paniculata* was reported as having antioxidant property [75]. The hydroxyl radical scavenging activity is more effective in the leaf extract of *A. paniculata* [76]. It has been reported that the aqueous extract of *A. paniculata* enhance the activities of catalase, superoxide dismutase and glutathione S-transferase enzymes and reduces lactate dehydrogenase enzyme activity [77]. *A. paniculata* extract act as antioxidant and are able to remove free radicals and prevent cell damages and stress responsible for many degenerative disorders [78]. The antioxidant activity in *A. paniculata* was found effective in reactivation of enzyme superoxide dismutase and its activity was examined by DPPH radical scavenging assay and confirmed by total reducing capacity [79].

7.4 Anti-inflammatory activity

In folk medicine *Andrographis paniculata* bioactive components e.g. andrographolide, neoandrographolide, deoxyandrographolide were used reduce inflammation. Andrographolide prevents the production of oxygen radical by human neutrophils and inhibits COX-2 expression in human fibroblast cells [80]. The andrographolide and its derivatives showed anti-inflammatory effects against dimethylbenzene-induced ear edema due to inhibition of NO and PGE2 production in mice [81]. The active components of *A. paniculata* e.g. andrographolide, neoandrographolide, deoxy-andrographolide were used for lowering inflammation in folk medicine [82]. Andrographolide have anti-inflammatory activity, it inhibits the neutrophil adhesion or transmigration reaction through suppression of Mac-1 up regulation [83]. In mice the crude extract of plant and andrographolide can induce cell differentiation in myeloid leukemia cell [84]. The compound andrographolide possess an anti-inflammatory activity and it induces the expression of nitric oxide synthesis by inhibiting the protein synthesis activity [85]. It has been reported that in rats the chloroform extract of *A. paniculata* stem showed anti-inflammatory activity in hind paw oedemic model for acute inflammation [86]. Concentration dependent anti-inflammatory activity was recorded for diterpene lactones, neoandrographolide the isolated compounds from the methanol extract of *A. paniculata* [87]. It has been reported that *in vitro* and *in vivo* anti-inflammatory effects of andrographolide, where the release of inflammatory cytokines was inhibited by andrographolide [88]. Andrographolide is used as an alternative medicine in the treatment of autoimmune disease as it exhibits anti-inflammatory effects [89]. Neoandrographolide showed i*n vivo* and *in vitro* anti-inflammatory activities where administration of dimethyl benzene in mice showed significant reduction of ear edema [90].

7.5 Anti-cancer activity

Cancer is also treated by herbal medicinal plants. The cell growth is inhibited by andrographolide and the EGFR (epidermal growth factor receptor) and TfR (transferring receptor) are also affected by andrographolide. Andrographolide possess anticancer activity [91]. IL-6 played a key role in inflammatory response which results in activation of androgen receptor, growth and differentiation of cell and development of prostate cancer. The diterpene lactone, andrographolide isolated from *Andrographis paniculata* is used to inhibit expression of IL-6 and suppression of signals mediated by IL-6 [92]. The andrographolide increases the expression of CYP1A1 mRNA [93].

7.6 Hypoglycemic activity

It has been reported that in rabbits the aqueous extract of *Andrographis paniculata* is helpful in lowering hyperglycemia after glucose administration in which the absorption of glucose was inhibited by *A. paniculata* [94]. Investigation showed that the aqueous extract of *A. paniculata* was effective in lowering hyperglycemia in rats [95]. The aqueous extract of *A. paniculata* showed antidiabetic activity [94, 96]. The ethanol leaf extract having capacity to lower hyperglycemia along with oxidative stress and also concluded that andrographolide is active compound to lower down sugar level [96]. It has been also investigated that the diabetes mellitus induced by streptozotocin gets lowered by the oral intake of *A. paniculata* [97]. Wibudi *et al.* [98] have also confirmed antidiabetic property of the plant.

7.7 Anti-HIV activity

The anti-HIV activity was found in crude extract of *Andrographis paniculata* in H9 cell line [99]. It has been reported that anti-HIV activity is exhibited by seven compounds isolated from methanol and hexane extract of *A. paniculata i.e.* andrographolide, andrograpanin, bis-andrographolide, 14-deoxy-11, 12-didehydro-andrographolide, 5-hydroxy-7,8-dimethoxy-flavone,5-hydroxy-7,8-dimethoxyflavonone,14-deoxyandrographolide [100]. In a clinical trial it has been investigated that in 13 HIV patients the cell cycle regulation in HIV1 infected individuals was inhibited by andrographolide by raising the level of (CD4+) lymphocyte [101].

7.8 Hepatoprotective activity

Andrographolide exhibits hepatoprotective activity. It has been investigated that the liver damages induced by carbon tetrachloride in rats and mice were treated by andrographolide extracted from leaf of *Andrographis paniculata* and found positive result [102]. Among 26 different formulations, *A. paniculata* was one of them used in ayurvedic medicine for treatment of liver disorders. The hepatoprotective activity was observed in mice when treated with tert-butyl hydroperoxide or carbon tetra chloride[103.] The diterpenoids and andrographolide showed efficient choleretic potential for treating liver disorders in rats such as hepatitis and also damages induced by carbon tetrachloride, galactosamine and paracetamol [102, 104].

7.9 Anti-pyretic activity

In folk medicine *Andrographis paniculata* is used for lowering body temperature in many Asian countries. The aqueous extract of *A. paniculata* was used for reducing the body temperature and elongation of

pentobarbitone-induced sleeping time [105]. It has been reported that ethanol extract of *A. paniculata* (2.5gm) showed antipyretic effects on rabbits which was as effective as (300mg/kg) aspirin [106]. In China, it has been investigated that the active ingredients such as andrographolide, dehydroandrographolide, neo-andrographolide are useful to lower the body temperature in rats by inhibiting the activity of fever inducing agents like hemolytic *Streptococcus*, *Pneumococcus,* and 2,4 dinitrophenol [107].

7.10 Cardiovascular activity

The plant is widely recommended in cardiovascular therapy in many parts of world. The extract of *Andrographis paniculata* was used for dissolving blood clots by promoting the activation of fibrinolysis [107]. The cardiovascular activity was studied in anaesthetized rats in which the arterial pressure and heart rate was reduced by 14-deoxyandrographolide and 14-deoxy-11, 12-didehydroandrographolide [108]. The crude extract of *A. paniculata* was used for lowering the risk of damage to the heart muscle after myocardial infarction in rabbits in which the nitric oxide label is maintained by the plant and found effective in protecting endothelial functions [109]. Observation showed that in human the platelet activating factor (PAF) and eicosanoids are the main inflammatory mediators and the platelet activating factor is inhibited by andrographolide [110]. The clinical studies on rats showed anti-hyperglycemic effect of andrographolide in streptozotocin-induced diabetic rats [111].

7.11 Psycho-pharmacological activity

The clinical and pharmacological study demonstrated that the aqueous extract of *Andrographis paniculata* act as depressant in central nervous system and showed motor in-coordination and muscle relaxant activity [112]. It has been reported that the plant extract of *A. paniculata* showed positive impact for protection of neurodegeneration [113].

7.12 Upper respiratory infections

Several authors have reported positive response of extract of *Andrographis paniculata* in upper respiratory tract infections [114, 115]. In China, it has been observed that the oral administration of andrographolide showed effective results against respiratory infection. During common cold *A. paniculata* reduces the body temperature along with respiratory tract infection [116].

7.13 Anti-venom activity

Andrographis paniculata possess anti-venom activities and have been also reported from different parts of the world. It has been reported that 10

patients of viper bite were cured by taking the formulations of *A. paniculata* [117]. The methanol extract of *A. paniculata* showed potent venom reducing activity of *Daboia russelli* [118]. The tribal peoples of Raigarh district of Chhattisgarh are using the plant extract for the treatment of snake bite [119]. It has been studied that at dose quantity of 2g/kg bw *A. paniculata* showed anti-venom activity against Cobra snake [120]. The crude extract of *A. paniculata* at the dose quantity of 1g/kg bw possess anti-scorpion venom activity [121].

7.14 Effects on reproductive system

It has been reported that in pregnant mice abortion is induced by administration of *Andrographis paniculata* in addition, it was also found that in humans the placental chorionic trophoblastic cells were suppressed by the activity of this herb [122]. Clinical studies on pregnant female mice showed failure when treated with *A. paniculata* mixed food during mating period with normal male mice [123]. In male albino mice spermatogenesis was inhibited by dried leaf powder of *A. paniculata* and andrographolide and several changes were observed in seminiferous tubules, epididymis, seminal vesicle, leydig cells, and ventral prostate and coagulating glands have been reported degenerative in nature. Thus it was confirmed that the compound andrographolide can act as male contraceptive [124]. *A. paniculata* showed antifertility as well as pregnancy terminating activity [125].

7.15 Contradictions

The plant was classified as class2b “herb not to be taken during pregnancy” according to botanical safety handbook [126]. The extract of *Andrographis paniculata* in higher quantity causes adverse health problems like headache, gastric discomfort vomiting anaphylactic effects and by reducing the blood clotting activity, platelet aggregation it induces severe bleeding and bruising activity [127]. Andrographolide causes loss of appetite, gastric problems, and nausea on overdosing of crude extract [128].

8. Conclusion

Andrographis paniculata is a wonder plant with wide range of pharmacological properties. The plant is well known for its ethnomedicinal claims and used for treatment of various diseases such as liver toxicity, cardiovascular disease abdominal problems, central nervous system, snake bites, cancer, HIV, respiratory infection, viral infection, fever, diarrhea, common cold, bacterial infections etc. The plant is not toxic but overdosing may cause critical health problems. Besides its wider pharmaceutical uses the drug is recommended unsafe during pregnancy. As *A. paniculata* is used

for medicinal purpose for long time in acute and chronic diseases, it should be therapeutically safe for clinical purpose. So on the basis of present text it is essential to find out other entire group of phytocompounds and to evaluate their pharmacokinetics and pharmacodynamics for wider application.

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आज़ादी का अमृत महोत्सव

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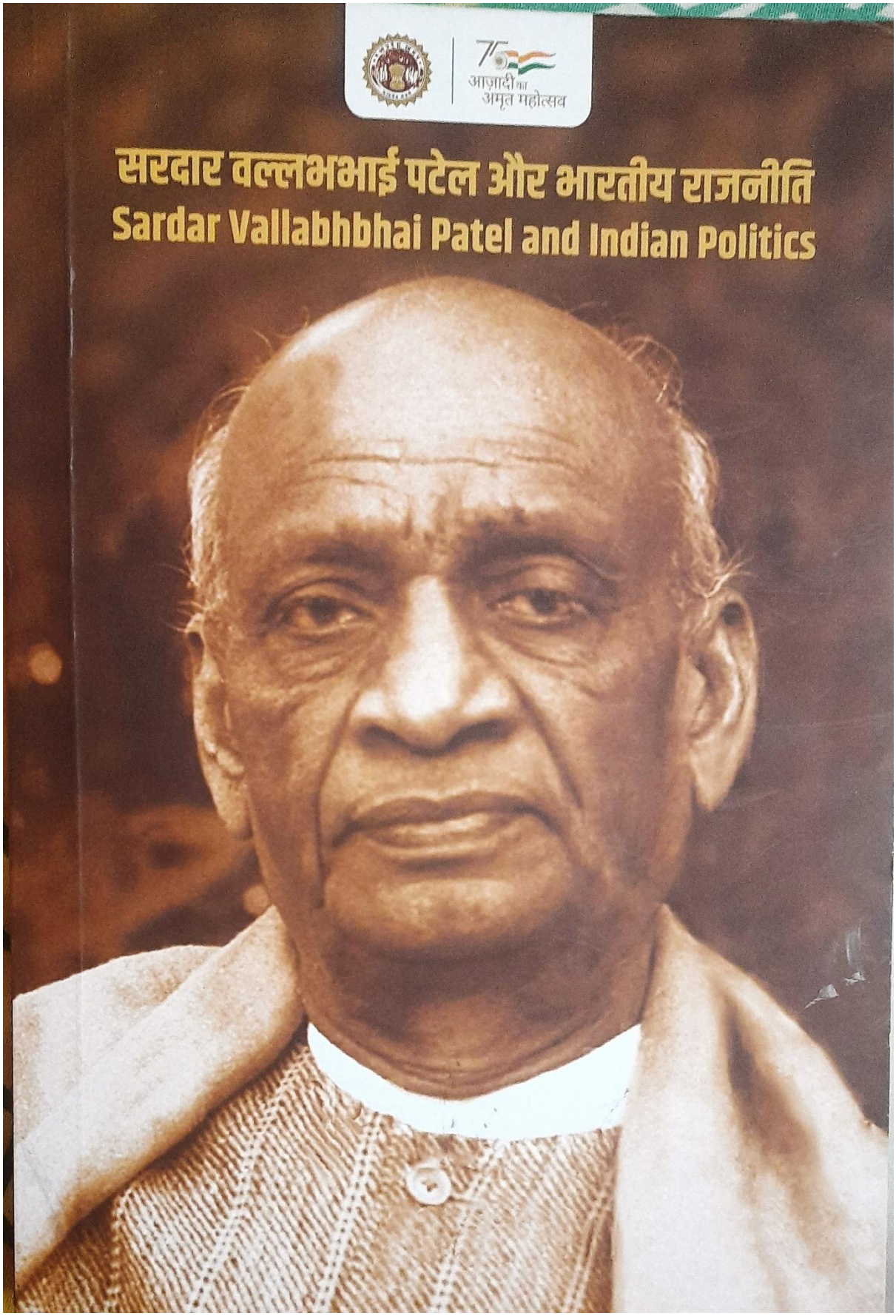
Sardar Vallabhbhai Patel and Indian Politics



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विषय सूची

An Historical Overview of Accession of Native States of Chhattisgarh

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Introduction

The process of integration of princely states into Indian union was started on 14th November 1947 with the taking charge of Nilgiri state by Orissa Government and completed with the march of Indian army to Hyderabad on 13th September, 1948.[1] It is on the basis of the consent of the princes being treated as a condition precedent to their joining India that the problem of States was being foisted on Indian leaders in reply to their demand for independence. The problem of States was considered as a major one next to the Hindu –Muslim problem. Fortunately, India decided to have independence and she had it. Unfortunately, she had independence with Hindu-Muslim Problem unsolved, the result of which was the creation of another State.[2]

Nature has made India a more or less self-sufficient unit, but historical accidents have divided her into a large number of separate political entities.[3] Historically, geographically and ethno-logically, the Indian states are part and parcel of India.[4] Rulers like Chandragupta Maurya, Samudra Gupta, Harvardhan in ancient India, and Mughal rulers from Akbar to Aurangzeb made thier efforts to unite the whole India and bring it under single political entity After the downfall of Mughals, the Marathas tried to establish political unity of India but after their defeat in third battle of Panipat, the East India Company got opportunity to bring India under British sovereignty.[5]

The British Empire in India presents the curious phenomenon of having been built by the agents of the company in India. It was in the process of protecting its commercial stake in the country Clive actually laid the foundations of the British Empire in India. Warren continued the work of Clive and left the British Possession in India much larger and more secure. By system of subsidiary alliance, Lord Wellesley expanded the British Empire considerably. Applying the "Doctrine of Lapse', Lord Dalhousie acquired vast territories for the company. The Indian Rulers for the most part, not only remained aloof from the 1857 movement but in certain cases extended active assistance to the British in suppressing it. The realization that

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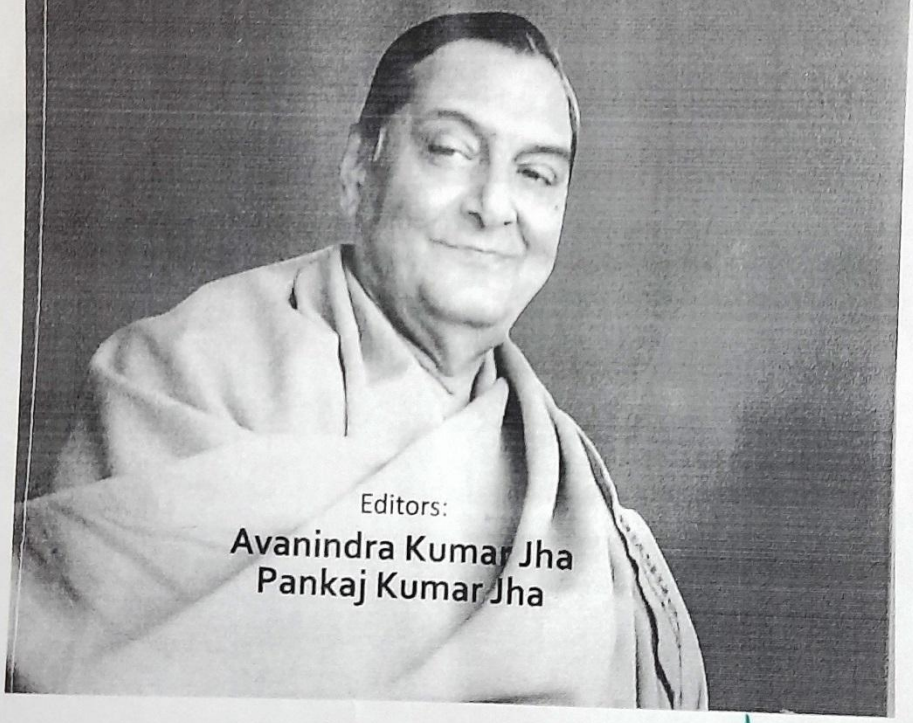

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Contents

A Survey of Sources of the History of Chhattisgarh (1800-1950)

Anil Kumar Pandey

I have made efforts in this paper to point out the main sources of the history of Chhattisgarh, (from ancient period to modern period) written between 1800 and 1950, which every scholar interested in the history of Chhattisgarh should know. The present work is divided into five parts. The first part gives a brief introduction of the state. In part second, I have given information about the sources of important inscriptions relating to Chhattisgarh. Part third of this paper provides information about all the official sources (archival as well as reports and gazetteers). Part four of the paper gives information about the reports and books of colonial officials as well as books written by Indian authors on Princely States of Chhattisgarh. And the last part of the paper deals with the sources of tribal history of Chhattisgarh.

I

Chhattisgarh, one of the youngest members of the Indian Union and well known as '*Dhan Ka Katora*' (Rice-bowl), was created on 1st November 2000. Chhattisgarh is synonymous with natural beauty and cultural richness. Situated in the heart of India, it is endowed with a rich cultural heritage and attractive natural diversity. The state shares its borders with six states of the country: Uttar Pradesh to the north, Jharkhand to the north-east, Orissa to the east, Madhya Pradesh to the west and north-west, Maharashtra to the south-west and Andhra Pradesh to the south-east. The geographical area of the state covers over 135,000 square kilometres and the total population in 2011 was 2,55,40,196 (about 2.55 crores). Chhattisgarh is situated between 17 to 23.7 degrees north latitude and 8.40 to 83.38 east longitude. The Tropic of Cancer runs through the State. The climate of Chhattisgarh is mainly tropical, humid, and sub-humid. The Mahanadi is the principal river of the State. The other major rivers are – Sheonath, Hadeo, Mand, Eeb, Pairi, Jonk, Kelo, Udanti, Indrawati, Arpa and Maniyari. Endowed with forests, rich mineral deposits and precious stones, this land held an irresistible allure to a

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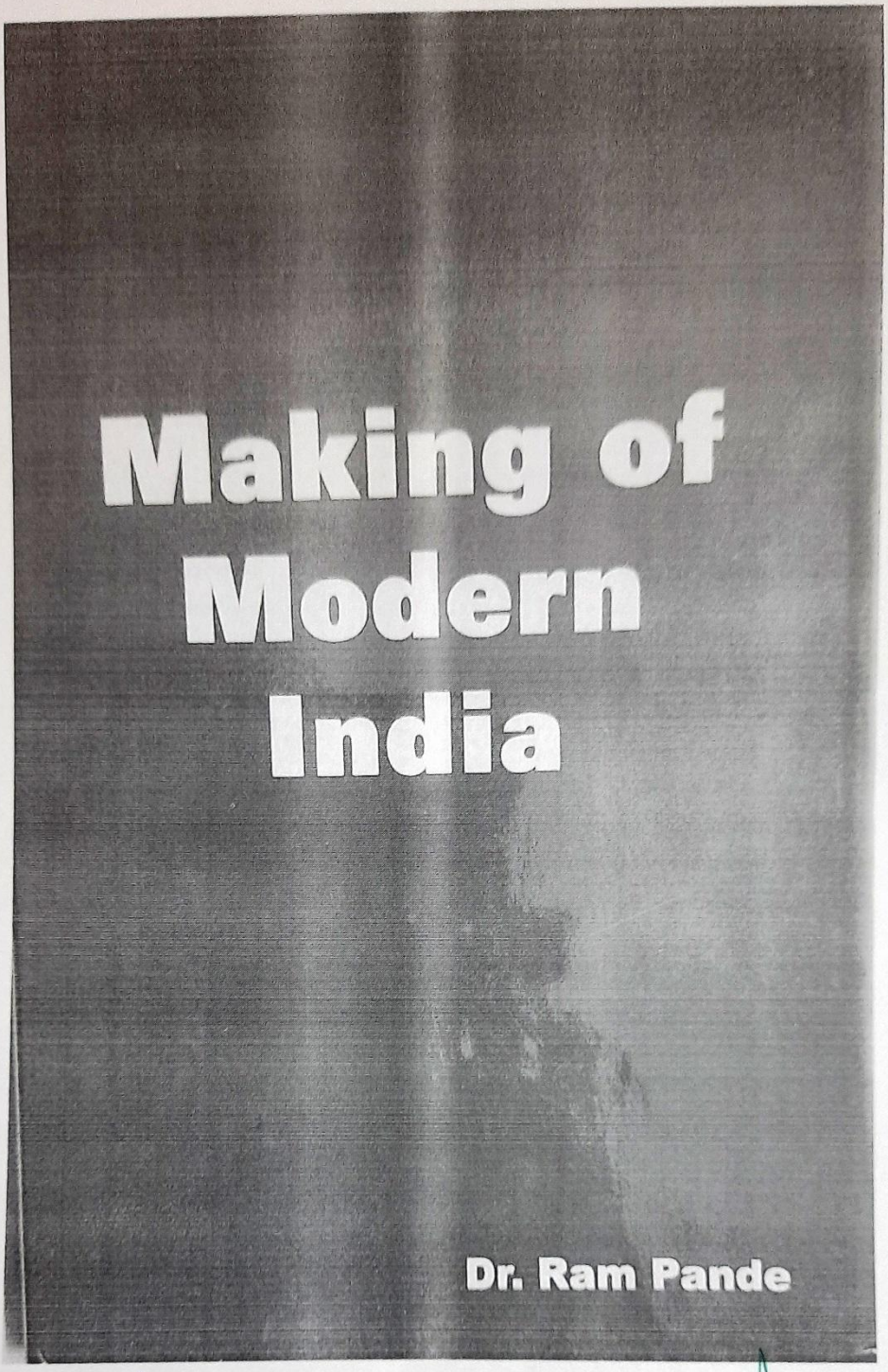
A Study on Death Rituals and Memorial Pillars of Tribes of Bastar

– Dr. Anil Kumar Pandey

The present paper deals with the death rituals of tribes of Bastar and their beliefs and rituals in relation to the memorial stone and how they stand up to these patterns of life even in the 21st century. The custom of erecting memorial stone in different parts of the world in prevalent on a large scale among the diverse communities from the Neolithic times. But in central India mainly in Bastar region, the erection of memorial stone in the memory of an ancestor is still in practice among different Gonds tribes.

Megaliths, as defined by Vere Gordon Childe "are ...constructed usually of large slabs or blocks of stone, either in their natural form of roughly quarried and trimmed". Megalithic tradition is helpful to unfold the history of early Iron Age communities. It would also enable us to trace out the antiquity of those communities who follow megalithic culture in present day. Research on the monuments and burials referred to as "megalith" or "pandukuls" or "pandukulis" in India was initiated in the beginning of the nineteenth century when Banbinton unearthed an interesting group of Burial monuments at Bangala Motta Paramba in the Northern part of Kerala in 1823. Subsequently many British administrators and other individuals excavated a large number of megaliths. Since the publication of J.W. Breeks work on the megalithic monuments of the Nilgiris in 1837, the megalithic monuments of the Tamilnadu have attracted the attention of archaeologists. The systematic study of the South Indian Megaliths started after 1940s and scholars like R.E.M Wheeler (1947), B.K. Thapar (mid. 1940s) and V.D. Krishnaswami (1949) studied the megaliths at Brahmagiri (Karnataka), Porkalam (Kerala) and Cochin(Kerala) regions.[1]

The megalithic cultures which still flourish in Chhattisgarh, north eastern States, and Orissa etc. have during recent years been studied in



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THE HISTORIOGRAPHICAL APPRAISAL OF THE SANNYASI REBELLION

– Dr. Anil Kumar Pandey

The Sannyasi rebellion is an important episode in the early colonial rule in India. The rebellion started 1750 onwards but took a violent turn since 1773 when Warren Hastings assumed the Governor-Generalship of Bengal. The movement covered a wide range of Bengal and Bihar and continued for a long time. Historians have not only debated what events constitute the rebellion, but have also varied on the significance of the rebellion in Indian history. The colonial historiography mainly portrays them either as dacoits, bandits or plunderers. Some historians refer to it as an early war for independence from foreign rule, since the right to collect tax had been given to the British East India Company after the Battle of Buxar in 1764. Marxist views the uprising as an early peasant rebellion against the British colonial exploitation.

I

In the present context the term sanyasi refers to the Dasnami sanyasi. We find that different words were used for them in the British documents; official accounts as well as by various authors. In the British documents and official accounts, they have been identified variously as 'gypsies of India', 'lawless mendicants', 'trading pilgrims', 'fanatics', 'religious vagrants', etc. W.W.Hunter[1] identified them as a set of 'lawless banditti.' H.H. Wilson considered them as 'erratic beggars' and 'religious vagrants' of the Hindu community.[2] G.S.Ghurey[3] and B.D.Tripathi[4] include them in the fold of Sadhus.

The term Sannyäsi refers to the Dasnämi Sannyäsis founded by the four disciples of the Great Sankarachärya. The four disciples of Sankar gathered ten disciples who were known as Dasanamis or ten names- Giri (hill), Puri (city), Bharati (learning), Ban (wood), Aranaya (forest),Parbat (mountain), Sagar (ocean), Tirta (temple), Ashram

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श्रमिक कल्याण नीति : डॉ. भीमराव अम्बेडकर एवं बाबू जगजीवन राम के कार्यों का मूल्यांकन

– डॉ. अनिल कुमार पाण्डेय

डॉ. भीमराव अम्बेडकर तथा बाबू जगजीवन राम दोनों भारत में एक आदर्श समाज की स्थापना के प्रबल समर्थक थें। समाज जो समतामूलक, शोषणविहीन, वर्गविहीन, जातिविहीन हो । यह समाज स्वतंत्रता, समानता तथा बंधुत्व की आधारशिला पर आधारित हो तथा जिसमे सबको राजनैतिक, सामाजिक तथा आर्थिक न्याय प्राप्त हो ।

डॉ. अम्बेडकर तथा बाबू जगजीवन राम दोनों के व्यक्तित्व में काफी समानताएं है। इन दोनों महापुरुषों का जन्म हिन्दू समाज के सबसे शोषित, पीड़ित तथा दलित वर्ग में हुआ था । इन्होनें समान रूप से हिन्दू सामाजिक कुप्रथा का उत्पीड़न अपने विद्यार्थी तथा सामाजिक जीवन में भोगा था। इन्होनें अपने भाषण, लेखनी तथा कार्यों द्वारा दलित, पीड़ित तथा श्रमिक वर्गों के शोषण के खिलाफ अपनी आवाज बुलंद की तथा सामाजिक एवम आर्थिक न्याय की स्थापना की पुरजोर वकालत की। दोनों ने इंडियन लेबर कांफ्रेंस के चार-चार अधिवेशनों की अध्यक्षता की । इंडियन लेबर कांफ्रेंस की पहली बैठक नई दिल्ली में 22-23 जनवरी 1940 को श्री रामास्वामी मुदलियार की अध्यक्षता में सम्पन हुई। श्रम सदस्य के रूप में डॉ. अम्बेडकर ने नई दिल्ली में संपन्न चौथे से सातवें अधिवेशनों (07 अगस्त, 1942, 6-7 सितम्बर, 1943, 27-28 अक्टूबर, 1944 तथा 27-28 नवम्बर, 1945) की अध्यक्षता कर श्रमिक समस्याओं के समाधान का प्रयास किया । डॉ. अम्बेडकर के योग्य उत्तराधिकारी के रूप में बाबू जगजीवन राम ने नई दिल्ली में ही संपन्न अगले चार श्रमिक अधिवेशनों - 8वीं से 11वीं (21-22 अप्रैल, 1947, 19-21 अप्रैल, 1948, 20-21 मार्च, 1950 तथा 11-12 अगस्त, 1951) की अध्यक्षता कर महत्वपूर्ण श्रमिक समस्याओं का समाधान किया । बाबू जगजीवन राम 1946 में जवाहरलाल नेहरू के नेतृत्व में गठित अंतरिम सरकार के सबसे युवा कैबिनेट मंत्री तथा प्रथम श्रम मंत्री बने। संघीय श्रम मंत्री के रूप में उन्होंने 1946 से 1952 तक तथा श्रम, रोजगार और पुनर्वास मंत्री के रूप

NEW DIMENSIONS OF EARLY MEDIEVAL INDIA

(747 AD TO 1206 AD)

Dr. Ram Pande

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PACHRAHI EXCAVATION – NEW INSIGHTS ON EARLY MEDIEVIAL HISTORY OF CHHATTISGARH

– Dr. Anil Kumar Pandey

After division of Madhya Pradesh into Madhya Pradesh and Chhattisgarh, most of the important historical sites went into the side of mother state. The Department of Culture and Archaeology, Government of Chhattisgarh started a project to excavate at many potential sites of Chhattisgarh like Sirpur, Tala, Dipadih etc. With the encouragement of outstanding discoveries of these sites, the Department again launched a project of explorations and excavations in 2007-08. Under this project three sites are selected for major excavation work i.e. Mallhar, Sirpur and Pachrahi. Now excavation has also started in Tarri- Ghat near Patan. Excavation works at Mallahar gives chronological sequences from Proto- Historic period to medieval times. Excavations at Sirpur unearthed rich cultural heritage of Chhattisgarh. Sirpur, situated on the bank of Mahanadi, served a capital of Panduvamsis rulers. Besides Buddhist monasteries and stupas, many temples of Saivism, Vaishnavism and Jainism are found there. Settlement pattern throw light on a very rich economic and cultural life of the area. Like these two sites, excavation at Pachrahi also gives new insights on the medieval history of Chhattisgarh.

Historical Geography

Among the medieval sites of Chhattisgarh, Pachrahi happens to be one of the largest settlements situated on the western bank of the river Haup. Pachrahi[1] is located in the Kabirdham district of Chhattisgarh. It is about 45 Kms from Kawardha and 17 km, from Bodla. The site is situated on the right bank of river Haup, which originates from Banki village situated on the border of Madhya Pradesh and Chhattisgarh. Two rivers- Haup and Haupnin originate from the village, river Haupnin flows towards Madhya Pradesh and joins river Narmada. But the river Haup flows in the districts of Kabirdham and

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ACTIVITIES OF FORWARD BLOCK IN THE CENTRAL PROVINCES IN THE YEARS OF CRISIS (1939-42)

DR, ANIL KUMAR PANDEY
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Subhas Chandra Bose also called as Netaji, is an outstanding leader of the Indian National Move-ment. He founded Indian National Army (Azad Hind Fauj) to overthrow British Empire from India and came to acquire legendary status among Indian masses. Subhas Chandra Bose was born on January 23, 1897 in Cuttack, Orissa. His father Janaki Nath Bose was a famous lawyer and his mother Prabhavati Devi was a pious and religious lady. He was strongly influenced by Swami Vivekananda's teachings and was known for his patriotic zeal as a student. To fulfil his parents' wishes he went to England in 1919 to compete for Indian Civil Services. In England he appeared for the Indian Civil Service competitive examination in 1920, and came out fourth in order of merit. However, Subhas Chandra Bose was deeply disturbed by the Jallianwala Bagh massacre, and left his Civil Services apprenticeship midway to return to India in 1921.

After returning to India Netaji Subhash Chandra Bose came under the influence of Mahatma Gandhi and joined the Indian National Congress. On Gandhiji's instructions, he started working under Deshbandhu Chittaranjan Das, whom he later acknowledged his political guru. Soon he showed his leadership mettle and gained his way up in the Congress' hierarchy. In 1928 the Motilal Nehru Committee appointed by the Con-gress declared in favour of Domination Status, but Subhas Chandra Bose along with Jawaharlal Nehru op-posed it, and both asserted that they would be satisfied with nothing short of complete independence for India. Subhas also announced the formation of the Independence League. Subhas Chandra Bose was jailed during Civil Disobedience movement in 1930. He was released in 1931 after Gandhi-Irwin pact was signed. He protested against the Gandhi-Irwin pact and opposed the suspension of Civil Disobedience movement.

After the General Elections of 1937, Congress came to power in seven states and Subash Chandra Bose was released. Shortly afterwards he was elected President of the Haripura Congress Session in 1938. During his term as Congress President, he talked of planning in concrete terms, and set up a National planning Committee in October that year. At the end of his first term, the presidential election to the Tripuri Congress session took place early 1939. Subhas Chandra Bose was re-elected, defeating Dr. Pattabhi Sitaramayya who had been backed by Mahatma Gandhi and the Congress Working Committee. There was much oppo-sition to his rigid stand, and he resigned from Congress President ship on 29 April 1939.

In the changed situation created after Gandhi's opposition to the election of Subhash Chandra Bose as the president of the Indian National Congress, the latter resigned and Dr. Rajendra Prasad was elected as emergency President of the Congress. The Government was apprehensive that the victory of right wing would be followed by an intensification of left wing agitation.[1]

The Publication of the correspondence between Mahatma Gandhi and Mr. Subhash Chandra Bose was generally welcomed as clarifying the fundamental issues involved in the Congress presidential election. While the daily news and the leading Hindi papers justified the attitude adopted by Mahatma Gandhi and his retinue to dislodge Mr.Bose.[2]

On 3 May 1939, he declared the formation of Forward Bloc. On 22 June 1939 was held the All India Session in Mumbai where the Constitution and programme of Forward Bloc was adopted. Clouds of World

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COLONIAL FOREST POLICY AND FOREST SATYAGRAHA MOVEMENTS IN THE CENTRAL PROVINCES DURING CIVIL DISOBEDIENCE MOVEMENT

DR. ANIL KUMAR PANDEY
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A remarkable series of forest satyagraha movements started as a part of Civil Disobedience movement launched by Mahatatma Gandhi in 1930. In this paper, I have made my humble attempt to study the colonial forest policy and laws prior to 1930, and its effects of forest dwellers which ultimately led to forest movements in the Central Provinces. This paper is in two parts. In the first part, I have discussed about the forest laws from 1865 to 1927 and its influence on tribal people and forest dwellers. And in the second part, I have given a brief account of the forest satagraha movement in the Central Provinces during Civil Disobedience movement.

I

The industrial revolution influenced in a great way to the colonial forest policy in India. With the introduction and expansion of railways in India, wood particularly teak wood became a necessary requirement for sleepers. Wood were also in use for shipbuilding, weapon industries etc. Three elements of the industrial revolution influenced the colonial ecological policy. Firstly, there was a change in emphasis from resource gathering and subsistence production to the production of commodities and trade. There was a shift from production of self consumption to production for market. Secondly, Cooperation with neighbour became less important. So there was a breakdown of cohesive local communities. And, thirdly with the increasing domination of manufacture and commerce,