



ସାମ୍ୟବାଦୀ ଚିନ୍ତାର ବାହକ

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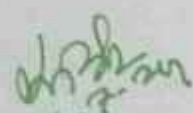
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- In: Energy Economics and the Environment: Conservation, Preservation and Sustainability
- Chapter DOI: <https://dx.doi.org/10.4135/9789353883102.n9>
- Subject: Energy Economics, Conservation, Ecology
- Keywords: air pollution, coal, coal mining, externalities, health, mining, natural resources

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## Environmental Externalities to Human Health near the Coal Mining Area

Tapaswini Nayak Indrani Roy Chowdhury

### Introduction

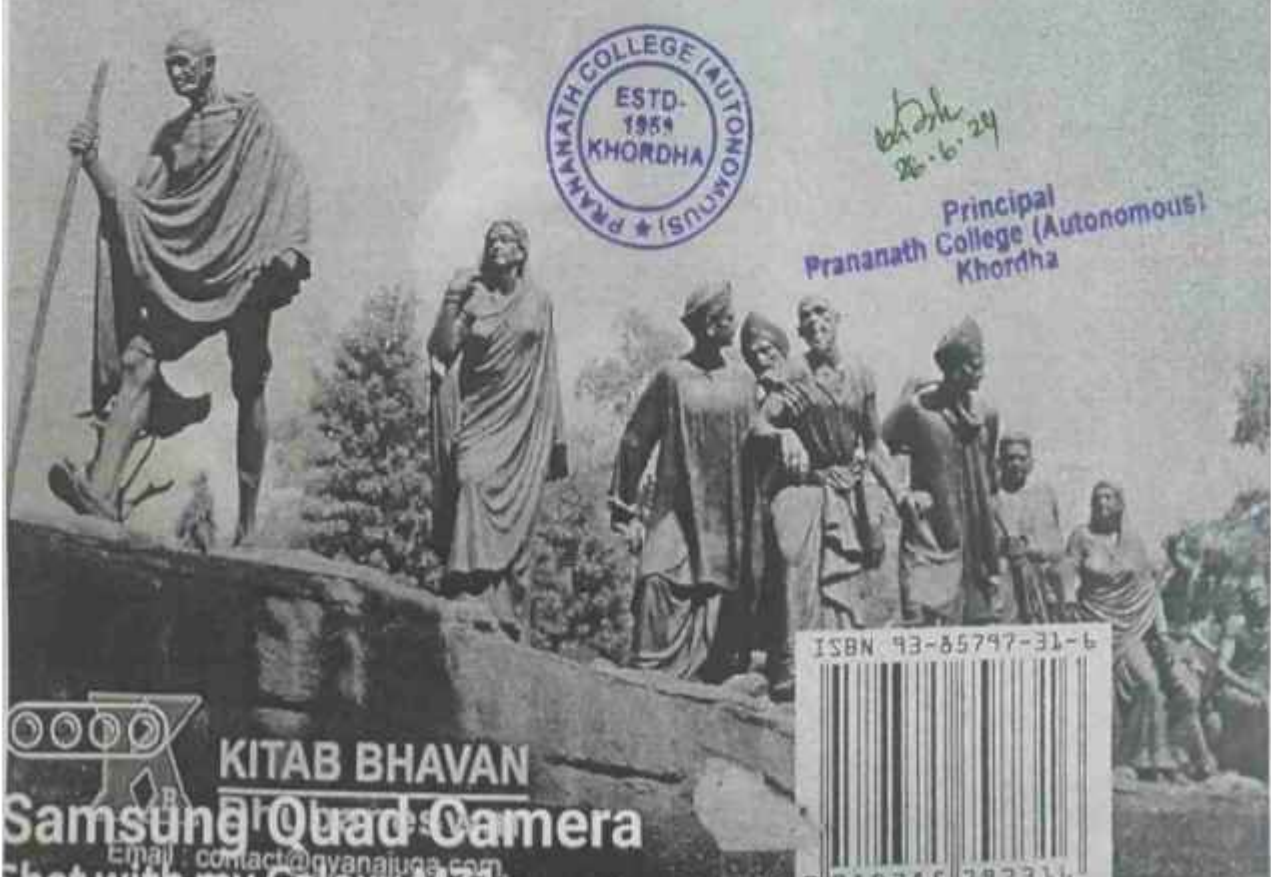
Mining in Odisha has an ancient origin and the mining industry occupies a special position in the state's economy. Specifically, the development of coal mining is undoubtedly a milestone in the field of industrial development of the state. Among minerals, coal—the black diamond—is considered as one of the crucial natural resources, which have immense possibility of contributing to the growth and development of not only the state's economy but also of the nation. Coal mining activities have different types of environmental, social and economic influences at international, national and regional levels. On the one



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SEPTEMBER 2018

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A MITTAL PUBLICATION

# GENDER DYNAMICS AND THE EMERGING ISSUES IN 21ST CENTURY

ALIVA MOHANTY • SAYANTANI BEHURA  
GEETANJALI NAIK • SUPRIT PANIGRAHI



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# FACTORS CAUSING GENDER DISCRIMINATION: A Case Study of Odisha, India

TAPASWINI NAYAK

## Introduction

The term "gender" refers to the rules, norms, customs and practices by which the biological differences between males and females are translated into socially constructed differences between men and women. However, both the genders together have given rise to this thriving humanity. Thus in reality both men and women are equally important in the development process. The World Development Report (1990) argues that women are solely disadvantaged as compared to men and face all manners of cultural, social, legal and economic obstacles that men do not face.

The problem is not of course unique to India, but it is particularly serious in this country. The world economic forum's Gender Gap Index for the year 2007 ranks India 114<sup>th</sup> among 128 countries. The index comprises economic, political, educational and health parameters. India has overall 59.4 percent gender equality. In "economic participation and opportunity" of women, India's position is 122 in the bottom 10, at- 39.8 percent.

In economic field, only 30 per cent of the workforces in soft ware's industry are women. Agricultural & allied industrial



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# GENDER DYNAMICS AND THE EMERGING ISSUES IN 21st CENTURY

— Edited by —

ALIVA MOHANTY  
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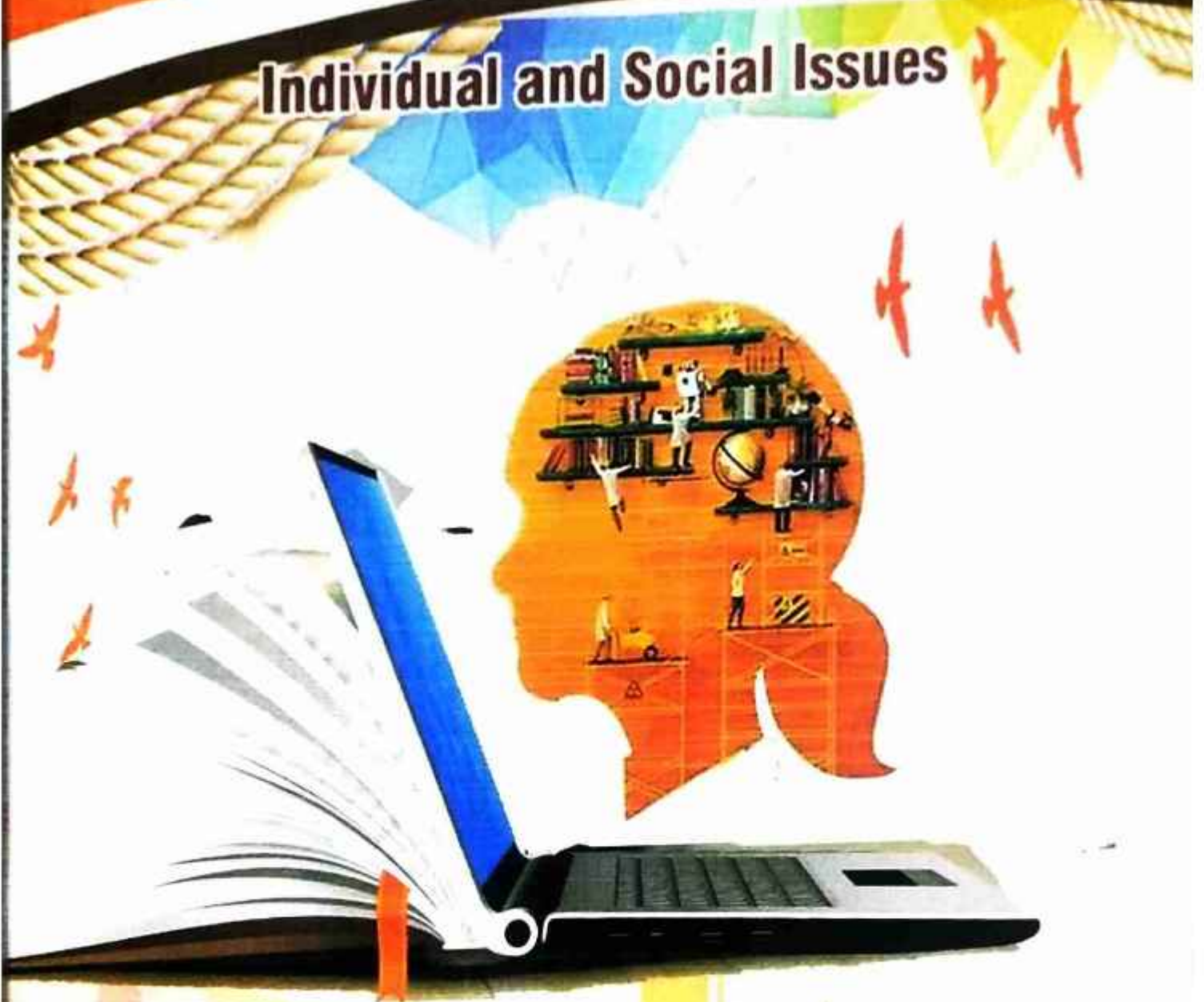


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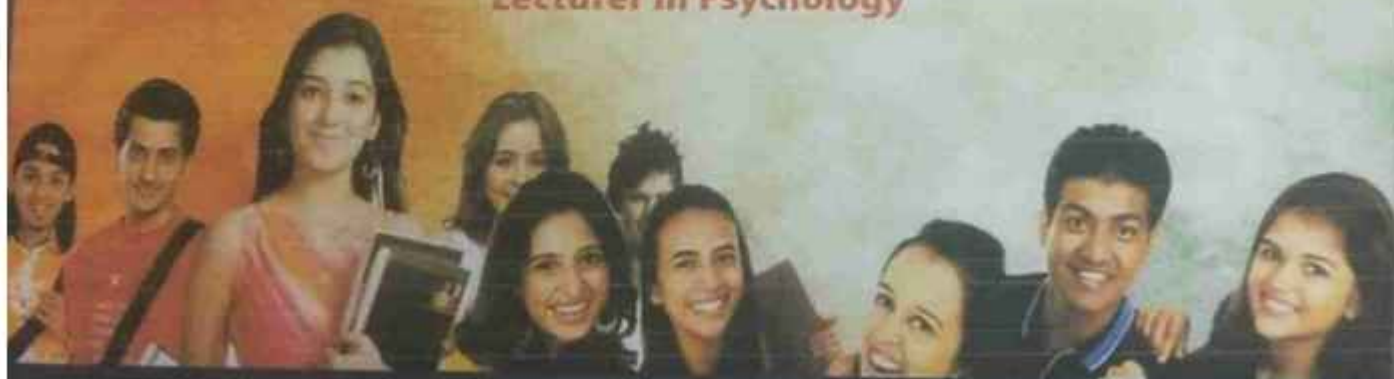
# Psychological Capital and Mental Health of College Students

**A Research Project**

An activity of research in fulfilment of the  
requirements for the award of  
Prananath Research Fellowship by the  
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She has been awarded Pranath Research Fellowship during the session 2022-2023 and her topic of research is "Psychological Capital and Mental Health of College Students". The finding of her study not only provided an understanding about the state of mental health of college students, but also pointed to a significant role of Psychological Capital in protecting their mental health. The implication of the study lies in the fact that by providing the college students to develop better Psychological Capital through structured training programs would help them to be mentally healthier.

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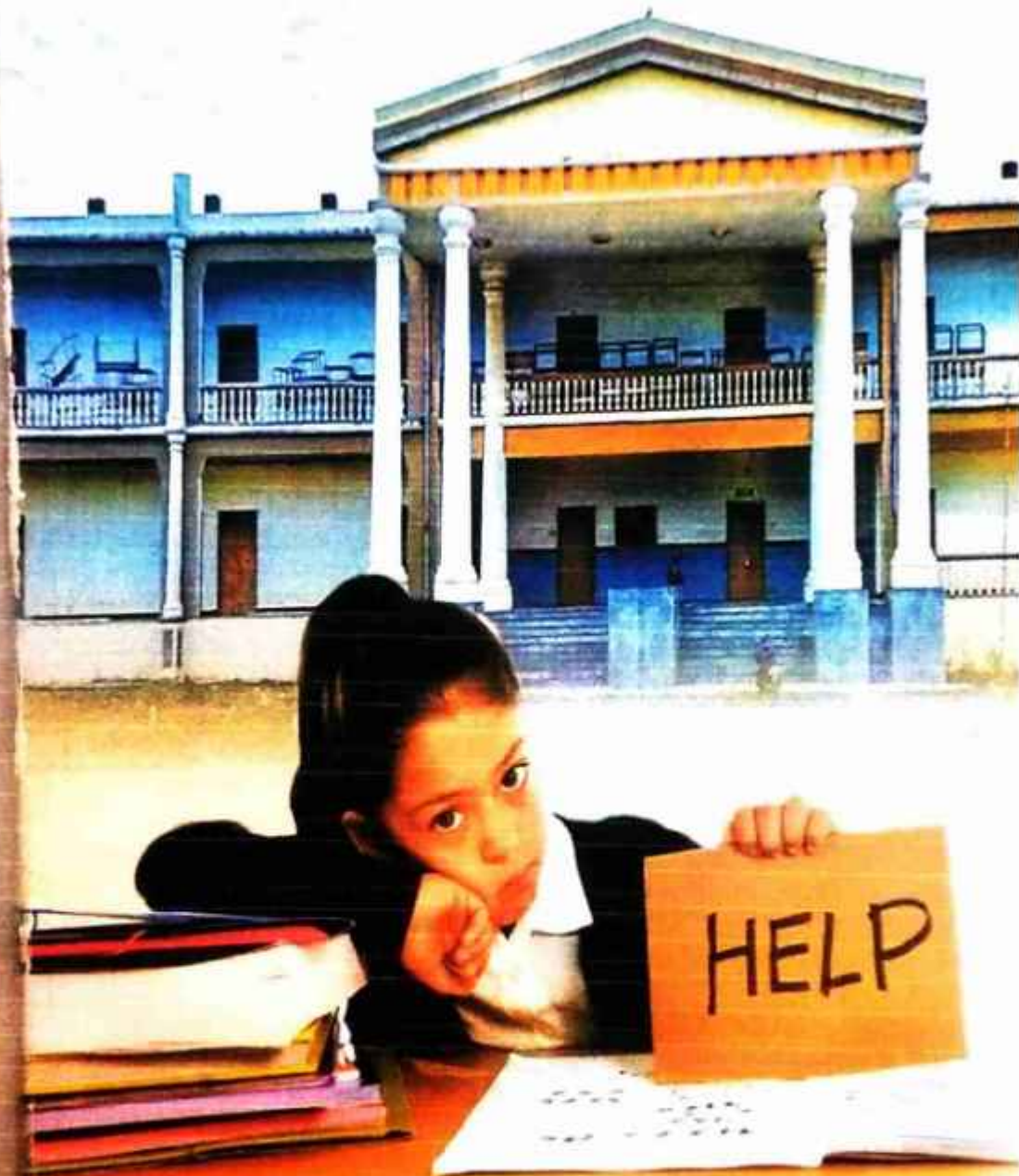
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## An Intervention Study



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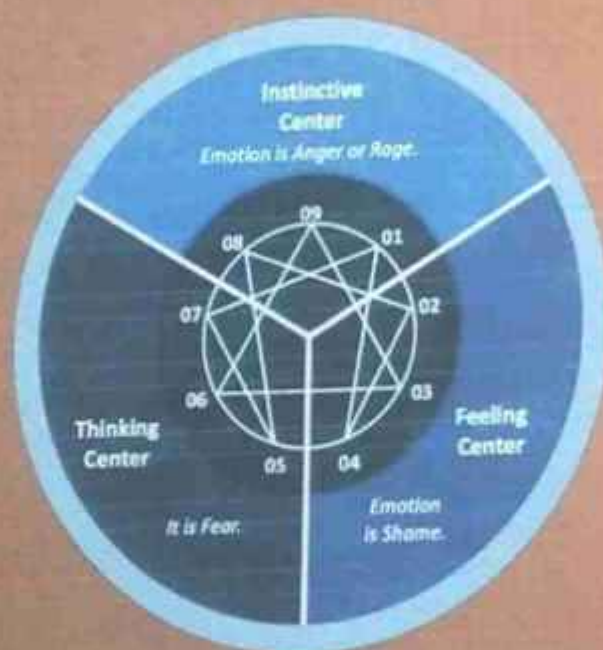
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# ENNEAGRAM PERSONALITY

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**Mrs. Jaha Varadwaj**, M. Phil. (Ravenshaw), is a topper from Utkal University in Master of Finance and Control, Master of Economics, and a Zonal topper in Master of Psychology from Indira Gandhi National Open University. She had her graduation from Ramadevi Women's College, Bhubaneswar, and M. Phil. from the Ravenshaw University, Cuttack. She is a recipient of Prof. P. K. Sahoo Young Researcher Award and presently pursuing her Ph. D. in Psychology in the Ravenshaw University, Cuttack. Initially, she started her career in the field of Finance Management, but subsequently took interest in teaching and research. For two years, she taught the teachers of the hearing impaired as a guest faculty in the Ali Yaver Jung National Institute for Hearing Impaired. She has published three books, five papers in peer reviewed Journals, and a chapter in an edited book. Her books include 'Counseling Psychology: Theories, Issues, and Applications'; 'Applied Psychology: Individual and Social Issues'; 'Emmagram Personality: Theory and Measurement' and 'Role of Women Entrepreneurship in Social Development'.



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ସମ୍ପାଦିକା- ସ୍ୱାମିପ୍ରା ସ୍ୱୟମ୍ପ୍ରଭା ପଟ୍ଟନାୟକ

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# ଶୋଭା ନାବ୍ୟବିତାନ : ଦୃଷ୍ଟି ଓ ଦିଗନ୍ତ



ସମ୍ପାଦନା  
ପ୍ରାଧ୍ୟାପିକା ସନ୍ଧ୍ୟାପ୍ରଭା-ପଟ୍ଟନାୟକ



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ଦ୍ୱାରା ପ୍ରକାଶିତ ପତ୍ରିକା ଏବଂ ପୁସ୍ତକ-

- ୧- “ଧୂଳିମୁଖ୍ୟ” ପତ୍ରିକାର ପ୍ରଥମ ସଂଖ୍ୟା ପ୍ରକାଶିତ ।
- ୨- ଭୂମିତୀ ସାବ୍ୟସିଦ୍ଧି ।
- ୩- ପୁରୁଷୋତ୍ତମ ସାବ୍ୟସିଦ୍ଧି ।
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- ୫- ପୂର୍ଣ୍ଣଚନ୍ଦ୍ର ଚନ୍ଦ୍ରୋଦୟ (ମୁଦ୍ରଣ ଓ ଦୀପ୍ୟା ଉପ) ।
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- ୮- ଉତ୍କଳରାଜ୍ୟ ସାବ୍ୟସିଦ୍ଧି ।
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- ୧୦- ଅର୍ଜୁନ ବୀର ସାବ୍ୟସିଦ୍ଧି ।
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# ଶୋରଧା

## ନାଟ୍ୟ ବିଗଳ



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ପିତୃକାଣ୍ଡ ବିଷୟରେ (ପୃଷ୍ଠା ୧୫୫) । ଶ୍ରୀମଦଭଗବତ୍  
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# ଶୋରଧା କବିତା କଲ୍ଲେକ୍ଟ



ସମ୍ପାଦନା : ପ୍ରାଧ୍ୟାପିକା ସନ୍ଧ୍ୟା ପଟ୍ଟନାୟକ



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Conservation, Preservation  
and Sustainability

*Sage Publishing*  
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## Cross-border Terrorism in South Asia

Sivani Baral  
J.K. Baral

### INTRODUCTION

In the national/international contexts, political violence springs from several sources such as ethnicism, sectarianism, religious fundamentalism, disputes over resources and border and from security threat. These sources of violence are not mutually exclusive. They may overlap; two or more than two of them may co-exist and reinforce one another. Terrorism is political violence, though it does not exhaust the whole of political violence. Depending on objectives, context and strategic dynamics, political violence manifests itself in different forms and terrorism is one of these forms. For the practicing group/ sponsoring state, terrorism is an instrument of its strategy aimed at terrorising the target (state/group) and forcing them to do something or to abstain from doing something. Terrorism involves indiscriminate use of violence against the target population – mostly civilians – though it is not unusual for the members of military, paramilitary and police to be the victims of terrorist violence.



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evolutionary biology. In Selts, D.E., Selts, P.S., and Drake, J.J. (eds.), *Molecular Systematics of Plants: II. DNA sequencing*. Chapman and Hall, New York, pp. 41-96.

Wang, K. L., Wang, J., Rut, P. P. and Shaw, P. C. 2004. Application of cytochrome b DNA sequences for the authentication of endangered snake species. *Herpetol. Sci. Int.* 19: 49-55.

Xu T., Chen, S., Chen, S., Zhang, D., Zhang, D., Cao, Q., Ge, X. 2007. ISSR analysis of genetic diversity of the Qinghai-Tibet Plateau endemic *Rhodiola chrysantheroides* (Cranulaceae). *Biochemical Systematics and Ecology* 35: 209-214.

Yang, M., Zhang, D., Liu, J. and Zheng, J. 2001. A molecular marker that is specific to medicinal rhubarb based on chloroplast *trnL/trnF* sequences. *Planta Med.* 67: 784-786.

Young, A., Boyle, T., and Brown, T. 1996. The population genetic consequence of habitat fragmentation for plants. *Trends Ecol.* 11: 413-418.

Zhang, M.Q. 2000. Discriminant analysis and its application in DNA sequence motif recognition. *Briefings in Bioinformatics*, 1(4).

Zhao, K. J., Deng, T. T., Cui, X. M., Tu, P. F. and Tsun, K. W. 2003. Genetic distinction of radix adonophore from its adulterants by the DNA sequence of 5S-rRNA spacer domains. *Am. J. Chin. Med.* 31: 919-926.

Ziegler, J., Diaz-Clavez, M.L., Kannel, R., Ammer, C., Kutschan, T.M. 2005. Comparative microarray analysis of morphine containing *Papaver somniferum* and eight morphine Papaver species identifies an O-methyltransferase involved in benzylisoquinoline alkaloid biosynthesis. *Planta* 222: 458-471.

Zhang, M.Q., Rafalski, A. Lohuda D. 1994. Genomic fingerprinting by SSR anchored polymerase chain reaction. *Genomics* 20: 176-183.



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## Plant Tissue Culture : A Biotechnological Tool for Conservation of Medicinal Plant

GTANJALI ROU<sup>1</sup>, LADUKESH PRASAD MISHRA<sup>1</sup>, PRIVAMBADA R. BISWAL<sup>1</sup> AND S.P. RATH<sup>2</sup>

### INTRODUCTION

Medicinal plants formed the basis and foundation of medicine and treatment of diseases at the very beginning of human civilization. From time immemorial thousands of plants having medicinal virtues of one kind or the other have been discovered. Since old times, in absent of modern medicinal remedies, people relied on herbal remedies derived from herbs and spices. There are many medicinal herbs and spices, which find place in day-to-day uses, many of these, are used as herbal remedies. It has now been established that the plants which naturally synthesize and accumulate some secondary metabolites like alkaloids, steroids, terpenes, flavonoids, saponins, glycosides, cyanogenics, tannins, resins, lactones, quinones, volatile oils etc. and contain minerals and vitamins possess medicinal properties. It is documented that 80% of the world population relies on traditional medicine largely plant based, for their primary health care needs (Tripathi & Tripathi, 2003; Dabey *et al.*, 2004). Plants are also the source of many modern medicines. It is estimated that approximately one quarter of prescribed drugs contain plant extracts or active ingredients obtained from or modeled on plant substances (Tripathi & Tripathi, 2003). It is estimated that more than 70,000 plant species are used medicinally worldwide (Bogers *et al.*, 2006). WHO has listed 2100 plant species for medicinal importance (Bogers *et al.*, 2006). However due to loss of habitat and continuous over exploitation medicinal plants species have become threatened. On the contrary biotechnological tools are important for multiplication and genetic enhancement of the medicinal plants by adopting techniques such as *in vitro* regeneration and genetic transformations. It can also be

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## *In vitro* propagation of *Adhatoda vasica* Nees. : A potential medicinal plant

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*In vitro* propagation of *Adhatoda vasica* Nees. was achieved through multiple shoot induction from nodal explants derived from *in vitro* grown shoots. The explants were cultured in MS medium supplemented with various concentrations of cytokinins (BAP or Kinetin). Among the two cytokinins tested BAP was found more effective than Kinetin for multiple shoot induction. Maximum percentage of shoot was observed in the MS medium supplemented with BAP (1.0 mg/l). The micro-shoots were elongated and successfully rooted in MS medium devoid of any phytohormones. Addition of auxin into MS medium had no significant effect on rooting. The micro shoots also rooted in the medium containing lower concentration of auxin (0.1-1.0 mg/l) but with increase in auxin concentration callusing was formed in the cut end. Rooted plantlets were successfully established in the soil with 85% of survival.

**Key Words:** *Adhatoda vasica*, multiple shoot, medicinal plants.

### Introduction

*Adhatoda vasica* Nees. (Vasak) a member of family Acanthaceae is an important medicinal plant and commonly grown as a hedge plant. The plant is highly valued for its bronchodialator effect which is due to its two alkaloids content viz. Vasicine and Vasicinine. All parts of the plant are used for herbal medicines. The leaf extract form an important constituent of many ayurvedic drugs for curing cough, bronchitis, asthma, rheumatism, diarrhoea and dysentery. The root is a valuable antiseptic, antiperiodic and antihelmintic. The fresh flowers are used in Ophthalmia and jaundice (Kirtikar & Basu, 1935). Due to its high medicinal value the plant is highly exploited. The plant rarely produces seeds and is mainly propagated by vegetative means. The alkaloid content of plant also varies with genotype therefore vegetative method of propagation is highly recommended (Dastur, 1985). Plant tissue culture acts as an alternative method for rapid clonal propagation and conservation of medicinal plants.

Micro propagation in *Adhatoda vasica* was earlier studied through nodal explant culture (Anand *et al.*, 2002; Azad *et al.*, 2003; Nath and Buragohain, 2005)

and through shoot tips (Abhyankar and Reddy, 2007); regeneration of plantlets from leaf derived callus culture (Amin *et al.*, 1997) and regeneration of plantlets from inter nodal explants (Azad *et al.*, 1998).

The present study was carried out to establish the micropropagation of *A. vasica* through axillary bud culture by manipulating the growth regulators.

### Materials and Methods

The terminal buds of *A. vasica* with 1-2 nodes were collected from healthy plants grown in medicinal plant garden of P.G. Dept. of Botany, Utkal University and were taken as explants. The explants were thoroughly washed with water to remove dust particles. Surface sterilization was carried out by treating the explants with 5% (v/v) teepol for 10 minutes and by keeping them under running tap water for 30 minutes. The explants were further surface sterilized with 0.1% (w/v) mercuric chloride (HgCl<sub>2</sub>) solution for 5 minutes under laminar air flow cabinet. The explants were cut into smaller segment with one node and inoculated in the cultured flask containing Murasighe & Skoog (MS) basal medium (1962) supplemented with various



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# Micropropagation of *Zingiber officinale* Rosc. through multiple shoot induction

Gitanjali Rout and S. P. Rath  
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## ABSTRACT

Micro propagation of *Zingiber officinale* Rosc. had been tried from bud culture through multiple shoot induction. The buds were cultured in Murashige and Skoog (1962) basal medium (MS-medium) fortified with various concentration of 6-BAP (0.5-6.0 mg l<sup>-1</sup>). Maximum number of shoots were observed in MS medium supplemented with 6-BAP (4 mg l<sup>-1</sup>). The in-vitro shoots also developed roots in the same medium.

## INTRODUCTION

*Zingiber officinale* Rosc. (Ginger) is identified to be a potential medicinal plant for curing Cold and its related diseases like Cough, Bronchitis, and Asthma etc. It is also used to cure Rheumatism, Gastro-intestinal disorder, Piles, Catarrhal and pulmonary diseases. Besides its medicinal importance, it is also a major spice crop and is a valuable source of foreign exchange for our country (Mohanty *et al.*, 1994). So its mass propagation is essential both for improvement of rural economy and health care system. Ginger is mostly prone to two diseases like rhizome-rot and ginger yellow. Further more it was got low multiplication rate (Bhagyalaxmi and Singh, 1988). Therefore, it is highly desirable to develop a method of producing disease free plant with high multiplication rates. In-vitro clonal multiplication of ginger acts as alternative means for this purpose.

In the present study trial has been taken to establish a protocol for multiple shoot induction in the local variety of ginger for rapid propagation.

## MATERIALS AND METHODS

The mature rhizomes of local variety of ginger were collected from the market and treated with 1% Malathion overnight and planted in sand for sprouting of buds. Sprouting occurred within 3-4 weeks. The clean rhizome explants (2-3cm) with sprouted buds

were treated with 5% Teepol for 10 minutes and washed thoroughly under running tap water for 30 minutes. Then these explants were surface sterilized aseptically with 0.1% HgCl<sub>2</sub> solution for 15 minutes and were rinsed with autoclaved double distilled water for 5-6 times to remove traces of HgCl<sub>2</sub>. The scaly leaves were removed and the explants (ca 1 cm each) were inoculated aseptically onto the culture medium. The MS (Murashige and Skoog, 1962) basal medium was fortified with 3% sucrose and 0.8% of Agar. The pH of the medium was adjusted to 5.8 before autoclaving. About 30ml of medium was dispensed into each 200ml screw capped bottle and capped tightly and autoclaved at 121°C for 20 minutes. For multiple shoot induction MS medium supplemented with 6-benzyle amino purine (6-BAP) in the concentration of 0.5-6.0 mg l<sup>-1</sup> was used and for in-vitro rooting half (1/2) strength MS medium supplemented with IAA (Indole acetic acid) in the concentration of 0.2-1.0 mg l<sup>-1</sup> was used. For each concentration ten replicates were taken and each observation was repeated for three times. The cultures were maintained at 25 ± 2°C with alternative period of 16 hours photoperiods and 8 hours dark period and at 55-60% of relative humidity.

The buds were first inoculated in MS+B<sub>6</sub> (0.5-6.0 mg l<sup>-1</sup>) medium. After 5-7 days of culture was observed that about 30-50% of the explants

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# MEDICINAL PLANTS AS THE ALTERNATIVE PREVENTION FOR CANCER AND ITS IMPLICATION IN OUR HEALTHCARE SYSTEM

P.R. Biswal, G. Rout, L.P. Mishra, S. Singh and S.P. Rath\*

Cancer is a greatest killer of human race, based on the loss of normal growth control that produces a growing tissue mass known as tumor. In tumors the rate of cell division exceeds the rate of cell loss and thus the number of dividing cells increase. The two types of tumors such as benign tumor grow in a confined local area and so are rarely life threatening but malignant tumors are more serious for development of Cancer as these are capable of spreading by invasion and metastasis. Cancer cells invade surrounding tissues and vessels and also transported to distant sites by the circulatory system. The variable site distribution of different cancers is dependent on a complex mixed diet, environmental factors, and life style factors such as tobacco, alcohol consumption and genetics.

It was estimated that in the year 2000, world wide over 10 million new cases of Cancer occurred (5.3 million men and 4.7 million women) and 6 million patients died from cancers. At present in India, every year approximately 6 lakhs people develop Cancer and 4-5 lakhs die out of this disease. The incidence of Cancer varies 120-140 new cases per year per 1,00,000 populations and 60-70% of cancers do occur over exposed parts like oral cavity, uterine cervix, breast etc in which early detection is possible in carcinoma in situ or stage I.

Prevention is essential and critical in a strategy against Cancer. Allopathic drugs, Chemotherapy, Radiotherapy, Immunotherapy and Gene therapy are administered to the patient basing on the type and stage to control the disease. Side effects of Allopathic drugs, Chemotherapy, Radiotherapy have scared people all over the world and the health care systems are going to become more and more expensive. In this critical situation there must be taken a consorted effort to find an alternative therapeutic effort.

Traditional systems medicines are assuming a great significance globally as "green drugs" are healthier than synthetic drugs. Several of the drugs sold today are simple synthetic modifications of the naturally obtained substances. Ayurveda based drugs known as immuno-modulators are often employed as supportive therapy to overcome

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## MEDICINAL PLANTS OF ORISSA AND OUR HEALTH CARE SYSTEM - I

P.R. Biswal, G. Rout, L.P. Mishra, T. Mishra, S. Singh and S.P. Rath\*

Medicinal plants are traditional, accessible and affordable source of primary healthcare. Marginalized people, who cannot afford or access formal health care systems, are especially dependent on traditional medicines; these are culturally familiar, technically simple, financially affordable and generally effective traditional medicines. There should be widespread interest in promoting traditional health systems to meet primary healthcare needs. As side effects of Allopathic drugs scare people, the healthcare systems are going to become more and more expensive. Always small measures can go a long way in preventing majority of diseases. Traditional systems of medicines are assuming a great significance globally as "green drugs" which are healthier and safer than synthetic drugs. Several drugs sold today are simple synthetic modifications of the naturally obtained substances. Most of the Ayurveda based drugs are important in the manufacture of various immunological vaccines and antibodies. In India 7000 species are reported to possess medicinal properties and these are serving as raw material to pharmaceutical and other Ayurveda based industries.

The present situation needs the full utilization, production potential of plant resources and to encourage people to use home remedies. There should be taken an infrastructure for extending cultivation and export of medicinal plants. It also simultaneously needs awareness on the utilization of medicinal plants by the common people.

Orissa is endowed with quite rich plant resources in general and medicinal plants in particular. Although quite good numbers of medicinal plants have been identified till today, many more of species have not yet been identified. Realising this, the present paper has been prepared enlisting the medicinal plants used by several Ayurved practitioners, Vaidyas and locally available unrecorded informations from common people. The plants of ethnobotanical significance relating to medicinal plants have also been taken care. Here many of the identified medicinal plant species are listed disease wise which are in use for curing and preventing various types of diseases, uniformly assigning the Botanical name, name of the family, Oriya vernacular name and plant parts used.

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# MEDICINAL PLANTS OF ORISSA AND OUR HEALTH CARE SYSTEM - II

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P.R. Biswal, G. Rout, L.P. Mishra, M. Dehora, S. Singh and S.P. Rath\*

Medicinal plants have occupied an important position in the socio cultural, spiritual and medicinal arena of urban, rural and tribal lives. The use of plant resources for medicinal purposes has been developed in ancient times. These occupy the major portion of the traditional drugs and constitute major components of preparations in any healing system. About 50,000 species are used world wide in traditional and folk remedies and majority of them are collected from our locality and also found wild. With the ongoing surveys, research and documentation efforts, plants used in our health care system are considerably increasing every day. Plant derived medicines used in our country play a key role in our health care system. In India, the indigenous modes of herbal treatment are a part of the culture and a dominant method for healing therapy. According to the estimation of WHO, 80% of the population of developing countries relies on traditional medicines, mostly plant drugs for their primary health care system.

In the present situation, due to emergence of ethnobotanical strategies, chemical and pharmaceutical studies of crude plant drugs are being dramatically modified. So the changes occurring in chemical and biological technologies have clearly contributed to the creation of new knowledge on the use of medicinal plant in the form of plant extracts, decoctions, infusions or soft herbal remedies instead of the classical pharmaceutical chemical drugs. These remedies are acceptable, cost effective, and economically viable and they are the only available source having a critical impact in the maintenance of our healthcare system. Here many of the identified medicinal plant species are listed disease wise, which are in use for curing and preventing various types of diseases, uniformly assigning the Botanical name, name of the family, vernacular name (Oriya or English) and plant parts used (Table 1-4).

**Table-1 : Medicinal Plants Used for Cancer**

Sl. No.	Botanical Name	Family	Vernacular	Parts used
1.	<i>Adhatoda vasica</i> Nees.	Acanthaceae	Basanga	Leaves
2.	<i>Allium cepa</i> Linn.	Alliaceae	Red onion	Bulb
3.	<i>Allium sativum</i> Linn.	Alliaceae	Garlic	Bulb

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# *Flemingia nana* Roxb.: sal associated medicinal plant of Odisha state, India

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## ABSTRACT

*Flemingia nana* Roxb. is one of the unexplored sal associated medicinal plant, distinct from all other *Flemingia* species in having a dwarf suffruticose habit, broadly obovate leaves, petiole longer than leaflets, reported to be used in ulcers and swellings. There is a less documentation available on its various usefulness. Keeping this in mind, an attempt has been made to present its botany, ecology, and associated plants to bring attention towards its conservation in natural habitat. The photographs are provided for the easy identification in the field.

**Keywords:** *Flemingia*, unexplored plant, ecology, conservation

## INTRODUCTION

*Flemingia* is a genus of plants in the legume family Fabaceae. The generic name *Flemingia* Roxb. ex W.T. Aiton was validly published in Hortus Kewensis that listed six species (Ren and Gilbert 2010). Presently, the genus is comprising of about 30–35 species in the world (Lekhak et al. 2011) and 17 species and 1 variety in India (Gavade et al. 2016). *Flemingia* is native to South and South-East Asia, from India and Sri Lanka, to southern China and Indonesia and is widely distributed in subtropics of Taiwan, Cambodia, Laos, Myanmar, Thailand, Vietnam, Indonesia, Malaysia etc. *Flemingia* can tolerate



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