

A CASE STUDY

DOI : 10.15740/HAS/IJPP/8.1/199-203

# Forest trees at Kamalpur, Patamda valued for anticarcinogenic effects

■ SHILA KUMARI GOPE\* AND GEETA

Jamshedpur Women's College, JAMSHEDPUR (JHARKHAND) INDIA

## ARTICLE INFO

Received : 03.01.2015

Accepted : 18.03.2015

## KEY WORDS :

Antiproliferative, Anticarcinogenic,  
Antioxidant, Ethnomedicine

\*Corresponding author:

Email: [Shilagope75@gmail.com](mailto:Shilagope75@gmail.com)

## ABSTRACT

This paper has been an attempt to gather data on certain trees present in a small forest patch of Singhbhum at Patamda block for anticarcinogenic and antiproliferative activities co-operation from different tribal and rural people helped identifying the trees along with their local usage. These usage were compared and reevaluated with the published records on medicinal plants. Such trees are enlisted in this effort with their botanical name, families and local names. These trees should be conserved to promote development of bioactive molecules in future by creating awareness in local people.

**How to view point the article :** Gope, Shila Kumari and Geeta (2015). Forest trees at Kamalpur, Patamda valued for anticarcinogenic effects. *Internat. J. Plant Protec.*, **8**(1) : 199-203.

## INTRODUCTION

Even modern times of 21<sup>st</sup> century rural people still solely depends on mother nature's healing power because of herbal treatments are usually non evasive, cheaper and not harmful. The traditional knowledge passed on to them by their seniors might be lost as the latest development ruthlessly cut the existing forest trees for their multipurpose use. The ethnic practices followed by the rural people if collected together may prove to be useful to mankind with the whole scientific community for future research giving a solid resource base for the discovery of modern drugs. A survey by modern health organization estimated that 80 per cent of more than four thousands million plants have been used in traditional medicines. Even though the bioactive compounds in plants are unknown to common people, they prescribed because of their effectiveness, minimal side effects in clinical experience and relatively low cost (Kathryn *et al.*, 2006). The purpose of this paper is to assemble trees used for their anticarcinogenic effect from Bonkuchia forest of Kamalpur, Patamda where most

of the population belongs to Mahatos and Adivasis. These people have a vast unwritten treasure of knowledge of plants used as medicines for generations. The scientific activities reported so far from these plants are antifungal antioxidant and antiproliferative. The present study gives the detail list of such plants naturally growing in Bonkuchia forest. These trees must be conserved for future.

## MATERIAL AND METHODS

The enlistment of plants was made on the experience of people of Patamda and review of literatures based on medicinal plants. The Bonkuchia forest was surveyed from time to time in all possible seasons. Help from senior citizens and local villagers, farmers and students of Kasturba Gandhi Balika Vidyalaya Patamda with their parents was taken for inventorying through sampling and collection of specimens. Ethno botanical survey of the forest trees was made to collect the knowledge and share the experiences of those people. A fresh specimen of the plants were

Table A : Tree species recorded for the present study		
Sr. No.	Botanical name/ family local name/ common name	Medicinal values
1.	<i>Polyalthia longifolia</i> Family-Annonaceae Local name/Common name-False ashoka	<i>Polyalthia longifolia</i> has been used in traditional system for skin diseases diabetes and hypertension. It is strongly antibacterial for e-coli staphylococcus aureus and clausiella. The ethonolic stem bark extracts is found to be anticarcinogenic for human cancer cell (Manjulla <i>et al.</i> , 2010). Verma <i>et al.</i> (2008) reported the anticancer potential in the leaf extracts in chloroform for human cancer cell.
2.	<i>Alstonia scholaris</i> Family-Apocynaceae Local name/Common name-Chhachni/devil tree	Ethonolic leaf extracts of <i>A. scholaris</i> on cancer cells has been justified by its cytotoxic effects and antiproliferative actions.
3.	<i>Wrightia tinctoria</i> Family-Apocynaceae Local name/Common name-Swet kurchi/indrajav	The methnolic extracts <i>W. tinctoria</i> has showed cytotoxic activities in lymphocytes cells. It proves that it is a therapatic agent and effective anticancer agent which having immune modulatory action.
4.	<i>Holarrhena antidysentrica</i> Family-Apocynaceae Local name/Common name-Kurchi	<i>Holarrhena antidysentrica</i> is a very significant herbal drug in Ayurvedic system of medicine. The seed and bark of the tree has been used for a longtime for anemia and stomach troubles. It is very effective against human <i>Entamoeba histolytica</i> . Its anticancer effect against human <i>Epidermoid carcinoma</i> has been established.
5.	<i>Oroxylum indicum</i> Family-Bignoniaceae Local name/Common name-Bhaluk shakti	The bark from the trunk, branches, root of the tree dried in the sun and boiled with water to get a dark red coloured liquid as decoction. This is stored and taken four times with honey for preventing cancer (A.A Mao from Manipur).
6.	<i>Bombax ceiba</i> Linn Family-Bombacaceae Local name/Common name-Simoul/salmali	Methonolic extracts of leaves were found to have cytotoxic activity. It is found to be hepatoprotective and reduces the hepatotoxicity. Literatures available on <i>Bombax ceiba</i> depicted the fact that it is a popular remedy among the various ethnic groups for cancer.
7.	<i>Garuga pinnata</i> Family-Burseraceae Local name/Common name-Harmu	The methanolic extracts of various parts of <i>G. pinnata</i> was tested for <i>in vitro</i> cytotoxic potency in comparision to conventional anticancer drug cisplatin as a positive control. The inhibition of cell growth was noted in human tumer cell lines. Leaf and stem bark extracts exhibited highest anticancer activities. The cytotoxic activity of stem bark extracts indicates presence of phytochemicals which alter metabolic activation of potential carcinogens required for cancer cell divisions.
8.	<i>Tamarindus indica</i> Family-Caesalpinaceae Local name/Common name-Imli	The immune modulatory and antiproliferative activities of the polysaccharide isolated from the seed kernel of <i>T. indica</i> has been reported by Arvind in 2009. The apoptotic effect of the polysaccharide on cancer cells has been observed to be assessed in cell proliferation during cancer due to its antioxidant effect. In <i>T. indica</i> seed extracts has antioxidant enzyme induction properties and cancer related signal pathway blockage effect.
9.	<i>Terminalia chebula</i> Family-Combretaceae Local name/Common name-Hattaki	Researchers have shown <i>Terminalia chebula</i> has chebulanic acid, tannic acid and ellagic acid which are growth inhibitory phenolics. Ethonolic extracts of <i>Termentalia chebula</i> fruits inhibited cell proliferation and induce cell death in several malignant cell lines in human beings. Acetone extracts of bark and fruits are promising anticancerous.
10.	<i>Emblica officinalis</i> Family-Euphorbiaceae Local name/Common name-Aunla	<i>Emblica officinalis</i> is a store house of variety of nutritious and healthy compounds. The drugs derived from this plant have good source of anticancer activity agents (Satish <i>et al.</i> , 2012). The cytotoxicity was noted against five human cancer cell lines on which the extracts showed 82-98 per cent growth inhibitor of cancer cell. It is a known immune modulatory and anti oxidant. It was shown to be potent for radical scavenging agent (Jeena and Kuttan, 1995), thereby preventing carcinogenesis and mutagenesis.

Table A Contd...

Table A Contd...

Sr. No.	Botanical name/ family local name/ common name	Medicinal values
11.	<i>Mallotus philippinensis</i> Family-Euphorbiaceae Local name/Common name- Kamala	Every part of Mallotus is used medicinally as cytotoxic and immune modulatory. Fruits and barks of the plant contain tannins responsible for antioxidant activities. It contains mallotoxin and rottlerin which have great anticancerous potential. Rottlerin is used in chemotherapy.
12.	<i>Acacia nilotica</i> Family-Fabaceae Local name/Common name- Babul	Acacia nilotica is very high in bioactive secondary compounds and used as anticancer, antitumor and antioxidant tree. The leaves are rich in protein and the pods are used in the treatment of hemorrhages.
13	<i>Gmelina arborea</i> roxb. Family-Laminaceae Local name/Common name- Gamhar/white teak	<i>G. arborea</i> was found to be antioxidant possessing cytotoxic activity in cancer chemotherapeutics against the substances that damage components and structure of cells in biochemical pathways. (Hussein, 2014). The cytotoxic activities are due to the presence of certain bioactive secondary metabolites in the extracts. Most of the extract of leaves exhibited high digree of free radical scavenging activities. This indicates that the plant extracts are significant source of natural antioxidant.
14.	<i>Erythrina lysistemom</i> Family-Leguminaceae Local name/Common name- Paldhya	Erythrina is rich in alkaloids and flavanoid contents and found to have various biological activities. Monk, 1991 showed its maximum cytotoxic activities.
15.	<i>Bauhinia variegata</i> Family-Leguminaceae Local name/Common name- kurool	The anticancerous activity of Bauhinia has been established fact. Its bark extract used for the treatment of tumers and papilomous. It is chemo preventive for skin cancer. It is also used in managing skin discolouration.
16.	<i>Thespesia populnea</i> Family-Malvaceae Local name/Common name- Jaundice tree	The chemo preventive potential and lipid peroxidative effect of ethnolic extracts of <i>Thespesia populnea</i> bark has been found to be anticarcinogenic. The ethnolic extracts prevents tumor incidence.
17.	<i>Azadirachta indica</i> Family-Meliaceae Local name/Common name- Neem	The aqueous extract of neem leaf and bark is potent anticancerous drug. Its extracts are chemo preventive effects in the oral mucosa. It reduces the formation of lipid peroxides and enhances the level of antioxidants and detoxifying enzymes in the stomach and in the liver. Fruits seeds and oil are also used as superior drug.
18.	<i>Swietenia macrophylla</i> King Family-Melicaceae Local name/Common name- Mehgini/sky fruit	Swietenia exhibits antioxidants, antimutagenic and anticancerous effect. The phytochemistry and biological activities of swietenia in ethnolic extracts of its seeds is known to be tumer protector.
19.	<i>Mimusops elengi</i> Family-Myrtaceae Local name/Common name- Bol/Bakul tree	The drugs evolved from mimusops are effective against proliferating cells which produce cytotoxic effect by damaging the DNA during the cell cycle by blocking the formation of mitotic spindle during mitosis. The cytotoxic drug is sweet and possesses cardio tonic and astringent properties.
20.	<i>Madhuca longifolia</i> Family-Sapotaceae Local name/Common name- Mahua	Anticancer activity of ethanolic extract of madhuca when assessed the mean survival time was found to be increased weight while tumor volume, tumor cell count were found to be significantly reduced. Its efficacy offers the potential for reaching on understanding on anticancer potency (Sangameswaran <i>et al.</i> , 2012).
21.	<i>Helictres isora</i> Family-Sterculiaceae Local name/Common name- mochra	Rich source of medicinal compounds with wide range of properties also mentioned in ayurveda (Bapalal, 1982). It is also known as Avartani in ayurved. Tribals used this plant in the form of extracts as anticancerous treatment (Mathew, 1992). Fruits are used as cell cycle inhibitor therefore used as antioxidant and anticancerous (Mathu kumar, 2012).

Table A : Contd...

Table A : Contd...

Sr. No.	Botanical name/ family local name/ common name	Medicinal values
22.	<i>Pterocarpus marsupium</i> Roxb Family-Fabaceae Local name/Common name- Murga/Bijasal	As reported by Balachandra Prathap(2014), <i>Pterocarpus marsupium</i> may act as a cytotoxic and anticancer agent due to the presence of a dimethyl ester derivative of resveratrol. It was also found to cause apoptosis which was marked by DNA fragmentation and membrane distortion which result in inhibiting the cell proliferating factors. Remsburg 2008 also supported this view.
23 .	<i>Boswellia serrata</i> Family-Burseraceae Local name/Common name- Salai.	<i>Boswellia serrata</i> when analysed biochemically revealed to have a significant suppression of carcinogenic factors. The methanolic extracts of this plant was found to be specific and potent inhibitor of the main mechanism of cancer as supported by Mansour <i>et al.</i> , 2011 and Saraswati <i>et al.</i> , 2011. Also the study of Yadav, 2012. supported this finding as they found that acetyl keto B boswellic acid significantly suppressed cancers. These findings suggest that boswellic acid could inhibit the growth and metastasis of colon cancer through down regulation of cancer associated biomarkers.
24.	<i>Morinda citrifolia</i> Family-Rubiaceae Local name/Common name- Chouli/Noni	<i>Morinda citrifolia</i> has been used medicinally since ages in folk medicines. It is reported to have a broad range of therapeutic effects. The antigenotoxic potential was demonstrated on the alfatoxin B induced genotoxicity. Md. Sultan Ahmad, 2012 found its juice to be significant in reducing the frequency of chromosomal aberration and sister chromatid exchanges (Hundal, 1997). It was also noticed that the antigenotoxic potential of <i>Morinda citrifolia</i> juice shows dose response relationship. The fruit juice has significant level of antioxidants as proved by Auerbach <i>et al.</i> , 1992 and Wang Su, 2001. It was also found to have scavenged superoxide anion radicles (SAR) and quenched lipid peroxides. Thus it may possess cancer preventing organic compounds.
25.	<i>Semecarpus anacardium</i> Family-Anacardiaceae Local name/Common name- Bhela /Bhilwa	Antioxidant action of <i>Semecarpus anacardium</i> was monitored by the activity of antioxidant enzyme catalase, Superoxide dismutase and glutathione transferase. It was observed by Verma and Vinayak, 2009 that administration of aqueous extract of <i>Semecarpus anacardium</i> led to an increase in the antioxidant activities, indicating a decrease in carcinogenesis. The extract also regulates cell proliferation, apoptosis and carcinogenesis as proposed by Mathivandhani <i>et al.</i> , 2007 and Mates <i>et al.</i> , 2008. <i>Semecarpus anacardium</i> possesses a series of phenolic compounds and a variety of flavoures which may be attributed for anticarcinogenic activities.

collected and identified taxonomically by the experts, matching them with authentic herbarium, books and floras (Kirtikar and Basu, 1995; Naik, 1979, 1998 and Patil, 2003). The collected specimens were preserved also in the form of Herbarium. The trees were saved as photographs. A short term inventory was prepared by visual encounter survey (VES) to have a rapid bio-diversity assessment and to investigate the uses of trees of medicinal value for anticarcinogenic effects. Information about local names and plant and parts and their uses were recorded. It provided valuable information for most of the trees at localized site that provided data for species conservations. One set of every unknown specimen was sent for identification at Botanical Garden Shibpur Kolkata on 23.5.2014. Refer No – KGBV-/Pat/15/2013-14, Dated -1.11.2013. A total of twenty one plant species of high medicinal value are enlisted. All these plants have antioxidant and antiproliferative properties. Such plants are tabulated with their Botanical name, local name, family and uses as below : Twenty one

Tree species have been recorded in the present work and presented in the tabular form.

## RESULTS AND DISCUSSION

The complete ethno medicinal documentation of small forest like Bonkuchia, amidst some underdeveloped, suburb of the city should be taken care of for the conservation of trees. The information generated from the present study about such ethno medicinally important plants used by traditional people should be reviewed and be evaluated for proper biochemical analysis and phytochemical investigation, which may lead to development of potential biomolecule in the treatment of cancer and other disorders. This will ultimately lead to mass awareness of conservation of such plants before they are lost forever. The effect of ethanolic extracts of such plants should be tested on animal and human beings. The toxicity level of such plant should also be evaluated scientifically. Although people use such plants as medicinal applications in countless number of causes but investigation

should be carried out in relatively new areas of the functions of such plants.

#### Acknowledgement :

The authors are thankful to the director of Botanical garden Shibpur, Howrah for their inspiring thoughts on conservation of plants and their help and co-operation in identifying most of the trees. We are also thankful to local kids of school and their parents and few Vaidas for extending their tireless help in all seasons in the forest. We express our deep sense of gratitude to those tribal informants who vow to conserve the forest stretch.

#### REFERENCES

- Auerbach, B.J., Kiely, J.S. and Cornicell, J.A. (1992).** A spectrophotometric microtiter-based assay for the detection of hydroperoxy derivatives of linoleic acid. *Anal Biochem.*, **201**(2) : 375-80.
- Hussein, A., Shoeb, A.M.F., Madkour, L.A., Rafahy, M.A., Mohamed, A.M.S. and Ghareeb, M.A. (2014).** Antioxidant and cytotoxic activities of a gmelina arborea roxb. leaves. *British J. Pharma Res.*, **4**(1) : 124-144.
- Kathryn, A.R., Connie, M.R., Jaime, A.Y. and Neal, M.D (2006).** Pharmacometrics of Stilbenes. *Curr. Clin. Pharmacol.*, **1** : 81-101.
- Kumar, M. (2012).** Antioxidant and anticancer activity of *Helicteres isora* dried fruit solvent extracts. *J. Acad. Indus. Res.*, **1**(3) : 175-179.
- Manjula, S.N., Mruthunjaya, K., Parihar Vipin, K., Kumar, S., Nayak Pawan, G., Kumar, N., Ranganath, P.K.S. and Chamallamudi, R.M. (2010).** Antitumor and antioxidant activity of *Polyalthia longifolia* stem bark ethanol extract. *Pharmaceutical Biology*, **48** (6) : 690-696.
- Mates, J.M., Segura, J.A., Alonso, F.J. and Marquez, J. (2008).** Intracellular redox status and oxidative stress: implications for cell proliferation, apoptosis and carcinogenesis. *Arch. Toxicol.*, **82** (5) : 273-299.
- Mathivandhani, P., Shanthi, P. and Sachdanandam, P. (2007).** Apoptotic effect of *Semecarpus anacardium* nut extract on T47D breast cancer cell line. *Cell Biol. Int.*, **31** (10) : 1198-1206.
- Prathap, Bala Chandra, S., Rajitha, B., Anusha, C.H., Nagasirisha, M., Madhusudhana Chetty. and Mohamed Saleem, T.S. (2012).** *Pterocarpus marsupium* Roxb. A potent herb for life threatening diseases. *Internat. J. Res. Phytochem. Pharmacol.*, **2**(2) : 75-83.
- Saraswati, S., Pandey, M., Mathur, R. and Agrawal, S.S. (2011).** Bosewellic acid inhibits inflammatory angiogenesis in a murine sponge model, *Microvasc Res.*, **82**(3) : 263-268.
- Sultan Ahmad, M.D., Sheeba, A. and Rai, Kanchan B. (2012).** Cancer preventive effect of *Morinda citrifolia* (Noni) fruit juice against the aflatoxin B1-induced genotoxicity in human peripheral lymphocytes *in vitro*. *IOSR J. Pharmacy*, **2**(2) : 228-234.
- Verma, M., Singh, S.K. Bhushan, S., Sharma, V.K., Datt, P. and Kapahi, B.K. (2008).** *In vitro* cytotoxic potential of *Polyalthia longifolia* on human cancer cell lines and induction of apoptosis through mitochondrial-dependent pathway in HL-60 cells. *Chemico Biological Interactions*, **171** (1) : 45-56.
- Verma, N. and Vinayak, M. (2009).** *Semecarpus anacardium* nut extract promotes the antioxidant defence system and inhibits anaerobic metabolism during development of lymphoma. *Bio Sci.*, **29** (3) : 151- 164.
- Wang, M.Y. and Su, C. (2000).** Cancer preventive effect of *Morinda citrifolia*. The proceedings of the Strang International Cancer Prevention Conference. New York, U.S.A.
- Wang, MY. and Su, C. (2001).** Cancer preventive effect of *Morinda citrifolia* (Noni). *Ann NY Acad Sci.*, **952** : 161-168.
- Yadav, V.R., Prasad, S., Sung, B., Gelovani, J.G., Guha, S., Krishnan, S. and Aggarwal, B.B. (2012).** Boswellic acid inhibits growth and metastasis of human colorectal cancer in orthotopic mouse model by downregulating inflammatory, proliferative, invasive and angiogenic biomarkers, **130** (9) : 2176-2184.

#### ■ WEBLIOGRAPHY

**Walker, A., Hoy, M. and Meyerdirk, D. (2003).** Papaya mealybug Florida, Gainesville, FL. (<http://edis.ifas.ufl.edu/>, October 2007).

8<sup>th</sup>  
Year  
★★★★★ of Excellence ★★★★★