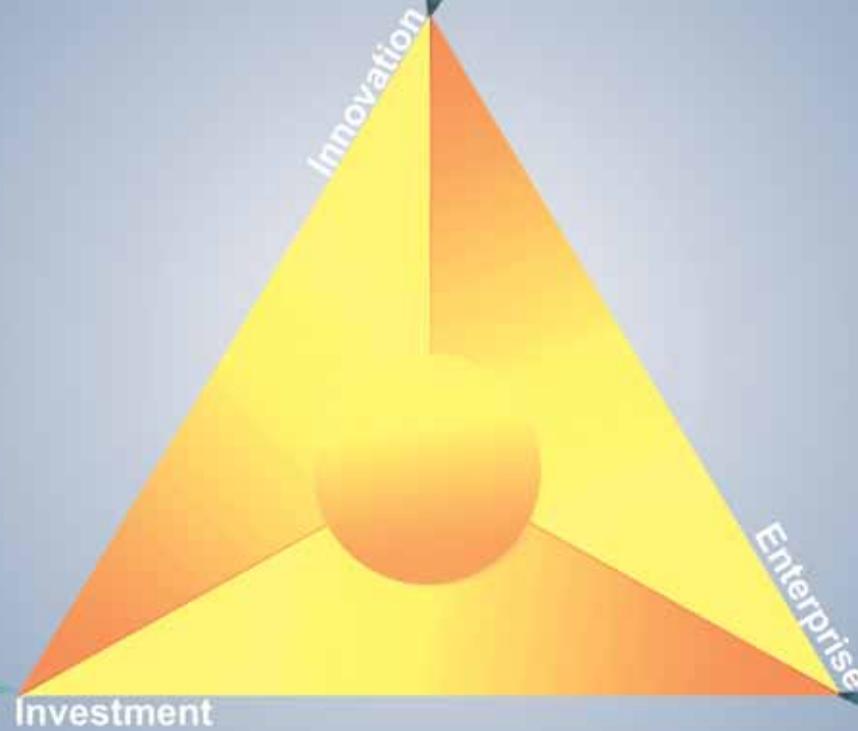




सृजनात्मकता की त्रिवेणी



Uttar Pradesh Innovates



Honey Bee Network

UTTAR PRADESH INNOVATES



National Innovation Foundation

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HONEY BEE NETWORK

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PREFACE

National Innovation Foundation (NIF) has been pursuing the mission of making India innovative and a creative society since 2000 with the active support of Department of Science and Technology, Government of India. Till date NIF has been able to scout innovations and traditional knowledge practices from over 545 districts across India.

Thanks to the support of volunteers from Honey Bee Network, we have been able to discover many unsung heroes of our society who have solved local problems without any outside help.

Despite various constraints, NIF has put together a small book celebrating creativity, innovation and traditional knowledge from Uttar Pradesh. I am conscious of its limitation in terms of coverage and outreach. But if we could uncover at least a few examples of the ability of local communities and individuals to solve problems on their own without outside

help, how much more can be done if state and private sector agencies join hands with NIF actively.

I invite the state government and its various organs to actively support our quest to uncover many more creative communities and individuals in rural and urban areas. NIF will then help in building value chain around them.

The book is divided in three parts. The mechanical innovations developed by innovators from Uttar Pradesh are covered in part one. Selected examples of herbal traditional knowledge are given in part two. The innovations from other parts of the country suitable for the development of Uttar Pradesh are given in part three.

By no stretch of imagination, could we claim that we have achieved a great deal. We have merely made a simple point. There are a large number of knowledge rich people who

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may not have been educated much, may in fact be economically poor also, but still have the ability to solve a few problems so well.

The challenge really is to work out a synergy so that no creative voice remains unheard, and no solution remains localized and unrecognized. By adapting public policy in support of grassroots innovators and traditional knowledge holders, we can make economic development process more inclusive and sustainable.

This book on innovations has been compiled at the request of Dr. Vijay Kelkar, Chairman, Finance Commission and the Member, Governing Council of the National Innovation Foundation as a tribute to the creativity and innovation at grassroots. This presentation is part of a series of innovation compendium prepared for every State of India. We hope this will be followed up in the form of concrete policy and

institutional initiatives in each State to empower creative people to improve the quality of life of common people and thus promote inclusive growth.

It is my belief that such examples will act as spur for other State government departments to look for creative efforts of their staff and users at ground level. I hope that NIF will have the opportunity to work closely with the State government in future and expand knowledge base, add value to selected technologies and help them diffuse through commercial and non-commercial social channels for improving the livelihood of the majority of the people.



R. A. Mashelkar, FRS
Chairperson, Governing Council
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Building a Bridge with Grassroots Innovators in Informal Sector

To make the Indian development process more inclusive, there is no escape from building upon creative and innovative experiments pursued by common people at village or semi-urban level. Many of these experiments lead to development of innovations, which can improve productivity and generate employment. However, the purpose of a particular innovator may often be to solve just his/her problem. There is no mechanism available for him to share the knowledge, innovation or practice with other people in different regions. Sometimes, ideas and innovations get diffused through word of mouth. But many times, these ideas remain localized. In the process, potential growth and social development gets constrained. To overcome this constraint, Honey Bee Network with a handful of volunteers triggered a movement, twenty years ago to scout, spawn and sustain the unaided innovations and outstanding traditional knowledge from the informal sector of our country.

Drawing upon this experience, National Innovation Foundation (NIF) was set up in 2000 with the help of Department of Science

and Technology, Government of India to scale up the idea of learning from grassroots innovators.

Under the inspiring leadership of Dr. R. A. Mashelkar, Chairperson NIF and former Director General, Council of Scientific and Industrial Research (CSIR), NIF has taken major initiatives to serve the knowledge-rich, economically poor people of the country. It is committed to make India innovative by documenting, adding value, protecting the intellectual property rights of the contemporary unaided technological innovators, as well as of outstanding traditional knowledge holders. It aims at promoting lateral learning among local communities to generate low cost affordable solutions of the persistent and emerging problems, and enhance the diffusion of innovations on a commercial as well as non-commercial basis.

How does NIF work?

Primarily, NIF has five functions: (a) Scouting and documentation, (b) Value addition and research and

¹ The Honeybee collects pollen from the flowers but they are not impoverished, in the process links one flower to another enabling cross-pollination. Similarly, the Honey Bee Network strengthens people-to-people contacts, learning and networking by pooling the solutions developed by individuals across the world

in different sectors. The network acknowledges the innovators, traditional knowledge producers and communicators so that they do not remain anonymous.

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development, (c) Business development and Micro Venture, (d) Intellectual Property Rights protection and (e) Dissemination, database development and IT applications.

NIF has been entrusted with the responsibility of building a National Register of Grassroots Innovations and Traditional Knowledge. It is not enough to document or disseminate the innovations or outstanding traditional knowledge. Value addition is very important for harnessing the full potential of the idea. NIF has entered into MOU with CSIR and Indian Council of Medical Research (ICMR) besides other organizations. CSIR has allocated funds to support research on grassroots innovations in CSIR labs. Similarly, ICMR supports research on such herbal healing knowledge, which has not been documented in the classical texts and formal institutional literature. NIF also helps in generating a very large pool of open source / public domain technologies. A small number of innovations are also protected by patents and other IPRs.

The Honey Bee Network strongly believes in sharing knowledge among the providers of innovations in their own language, which is achieved by publishing local language versions of Honey Bee newsletter. It also ensures that a fair

For most innovators, attracting risk capital for converting innovations into enterprise is very difficult. They neither can offer much collateral nor are they able to develop a business plan or deal with formal R&D system.

A Micro Venture Innovation Fund (MVIF) has been set up with the help of SIDBI to provide risk capital for technologies at different stages of incubation. Under single signature, innovators are trusted and investments are made to help them commercialise their innovations. Most innovators do not make good entrepreneurs. For entrepreneurship, one has to make consistent batch by batch production of products. Innovators are often incorrigible improvisers. They seldom make two things alike. NIF has helped such innovators to license their technologies to third party entrepreneurs. Most of the licenses have been given to small entrepreneurs and in a few cases, to medium enterprises.

A very elaborate benefit sharing system has been developed, governed by the Prior Informed Consent (PIC) of the knowledge

share of benefits arising from commercial exploitation of local knowledge and innovations reaches the innovators and knowledge providers.

providers. Attempt is made to share benefits not only with the innovators but also with their communities and for nature conservation. In addition, a small part is kept for contingency support to needy innovators, for R&D stakeholders, promoting women's innovations and meeting overhead costs.

It is remarkable that grassroots innovations are generating global demand, as evident from inquiries from around fifty-five countries for various technologies, NIF has succeeded in commercializing products across countries in six continents apart from being successful in materialising thirty cases of technology licensing with the help of partner agencies.

What has it done?

With major contribution from the Honey Bee Network, NIF has been able to build up a database of more than 1,40,000 ideas, innovations and traditional knowledge practices (not all unique, not all distinctive) from over 545 districts of the country.

NIF has filed 236 patents in India and seven in US and one PCT application. Out of these, 35 patents have been granted to grassroots innovations in India and five in US. NIF has funded

161 projects under MVIF to the extent of Rs.1.7 crores. Hundreds of technologies have diffused through farmer to farmer social network.

NIF has proved that Indian innovators can match anyone in the world when it comes to solving problems creatively. Where they perform better than rest is in generating more affordable sustainable solutions by using local resources frugally.

Those who see poor only as the consumer of cheap goods, miss the knowledge richness at the grassroots level. The Poor can be the Providers also.

The Grassroots to Global (G2G) model that NIF is propagating is all set to change the way the world looks at the creativity and innovations at grassroots.

How can state government join hands with NIF?

- a. NIF has no field extension unit nor does it want to have one. However, state government has several field functionaries in the area of agriculture, education, industry, rural development, women and child care, forestry, etc. There can be a very fruitful partnership between NIF as a

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- source of innovative ideas and technologies and state government as partner in dissemination, value addition and even commercialization through incentives, promotion, subsidies, etc.
- b. State government can join the national campaign for scouting innovations and traditional knowledge and motivate its grassroots functionaries to join hands with NIF in uncovering the talent at the community level.
 - c. Students in schools and colleges can be motivated to scout creative and innovative people in their neighbourhoods and send the entries to NIF (Post Box No.15051, Ambavadi, Ahmedabad 380 015, campaign@nifindia.org). Examples of innovations can also be included in the curriculum for the school and college education.
 - d. Demonstrations and trials can be organized at various regional research stations and KVKs (Krishi Vigyan Kendras) so as to create awareness about the creative potential of common people.
 - e. The research institutions can be mandated to add value to the knowledge of innovative people and help in protecting their knowledge rights.

- f. On the state's website, link to NIF can be given and the innovations from the region can be displayed to put forward the creative face of the state before the people.
- g. Some of the innovative people identified by NIF and/or state government could be awarded at district and state level besides giving them support for further work.
- h. A nodal officer could be appointed to keep in dynamic touch with NIF to ensure that all the areas of possible cooperation are explored.

I hope that NIF would be able to develop a functional, fruitful and fulfilling relationship with the State of Uttar Pradesh. Tremendously rich knowledge of biodiversity and environment besides numerous grassroots innovations can be leveraged through the proposed collaboration.



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“Innovation opens up new vistas of knowledge and new dimensions to our imagination to make everyday life more meaningful and richer in depth and content”.

- Dr. A.P.J. Abdul Kalam



“The purpose of innovation is to create a new value for an individual, team, organization or for society at large”.

- Dr. R.A. Mashelkar

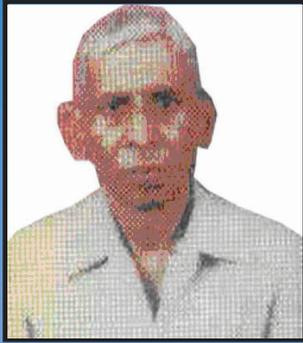
PART I

INNOVATIONS

from Uttar Pradesh

This section contains grassroots innovations emerging from the rural/urban areas of Uttar Pradesh





Late Ram Naresh Yadav
Kanpur

Diesel/bullock powered pump

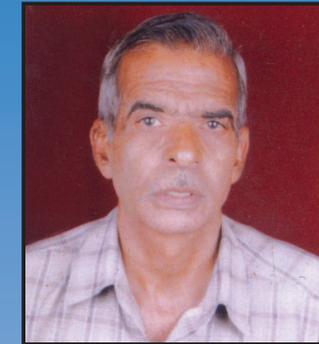
Ram Naresh had innovated a unique Power Saving Technical Pump (PSTP), which he claimed could alleviate the energy crisis faced in the agricultural sector. It was an amazing act of multi functionality, since the pump could be driven by two bullocks or the smaller version by two to four adult persons, or by electricity or diesel (using a 2 HP electric motor or a 3.5 HP diesel engine). A centrifugal pump is neither suitable for animal power nor can it pump beyond five to fifteen minutes under such conditions. It also requires priming where as this pump does not. The pump could prove very useful in drawing water from wells, borewells, ponds and canals and to irrigate high value crops saving fuel at the same time.

He won a National Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge in 2001. IIT Kanpur also tried to help him through NIF.



Chaff cutter with brakes

Commercially available motor or engine powered chaff cutters do not have any arrangement to stop the cutter immediately after discontinuing power. In the case of any accident or problem, even when the power is switched off, the cutter continues to rotate for a while due to momentum in fly wheel. Sometimes, when accidentally the feeder's hand gets pulled inside the gears along with fodder, the hand gets amputated due to the inertia of the heavy flywheel to which the blade is attached. Saifi pondered over this and developed a mechanism, which if employed would ensure a safe chaff-cutting machine. The innovative mechanism consists of a combination of simple mechanical clutch and brake, which is actuated by a foot operated lever. When one presses the lever, the flywheel of the chaff cutter instantaneously gets locked, and disengages the power source from the chaff cutter. One needs to re-open the lock to operate the chaff cutter again. Several research institutes and central agricultural research council had worked for years to develop a similar machine, but in vain. Though, very useful, the diffusion of the innovation has been very limited. NIF facilitated the coverage of his innovation by a BBC team for their program in January 2007 at IIMA.



Kamruddin Saifi*
Ghaziabad

* Professional registered with NIF. NIF only helps professionals in providing linkages and visibility



Karanpal Vishwakarma
Saharanpur

Improved forage cutter

The innovator has developed a modified version of forage cutter using improved materials and bearings to reduce drudgery. The device reduces wear & tear, increases ease of operation and makes forage cutting safe. The innovator has been supported by GIAN-North for its prototyping and pilot lot production and commercialization. He won a Consolation Award in NIF's First National Competition for Grassroots Innovations and Traditional Knowledge in 2001.

Paddy planter

Foto Singh has designed a manual paddy seedling planter. With the back and forth movement of the machine, mechanical fingers are actuated, which pick seedlings from the tray and transplant these into the puddled soil bed. The machine currently enables farmers to plant three rows of paddy at once, but design improvements could eventually increase this figure to five, nine, or even eleven rows at a time. SRISTI and NIF facilitated its on-field testing in Gujarat before farmers and based on their suggestions, the machine is being modified to suit the local needs.



Foto Singh
Meerut





Beni Singh
Lakhimpur Keri



In-plant germination of sugarcane

Beni Singh has developed a process of in-plant germination in sugarcane. One can induce bud germination on the sugarcane plant itself, cut the sets (nodes) and sow the early germinated nodes, instead of sowing sugarcane sets in the field and then letting them germinate. The crop cycle is reduced by about one month. It also benefits farmers as it saves the cost of double use of growth promoters and tractor based operations. The survival rate of the sugarcane is almost the same as when the planting is done after germination. Cost is reduced because germination is sure and uniform planting is done thus saving on labour for replanting. Further a nursery for sugarcane sowing can be developed as an enterprise.

He also has a number of other agricultural innovations to his credit such as the 21 feet tall sugarcane stalks developed without any fertiliser or pesticide, a new technique for reducing chemical and insecticide residue hazards as well as traditional household cures for dysentery and cough in livestock. He won a Consolation Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.



Bicycle operated horse shaver

Horses, mules, sheep, camels need to have their hair/wool cut regularly. Many owners have difficulty in getting this done as the electric/motor powered shear units are expensive, and far and few in the towns. In addition, hand shears do not achieve uniform cutting action.

Idris has developed a bicycle-powered horse shaver in which the power of the bicycle rotary drive is transferred via speed cable to the clippers to cut the hair. The bicycle operated horse shaver removes the drudgery of combing, sorting, gradual cutting and giving final touch to the animal's hair, which takes hours when done manually. This unit can make the owner self-reliant in doing this essential function, while retaining the basic functioning of the bicycle. This is a detachable arrangement whereby the bicycle can be used as usual without any problem after detaching the chain that drives the speed cable.



He won a Consolation Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.

06



Mohd Idris
Meerut





Jai Prakash Singh
Varanasi

New varieties of wheat, rice and pigeon pea

Jai Prakash Singh, an enterprising farmer has developed many improved varieties of wheat, rice and pigeon pea through recurrent selection of desirable plants and through crossing of the preferred parents. Virat (JP 6) is a new pigeon pea variety developed by him. It has coloured flowers, long leaves and bunchy type pods bearing at the top. The seed weight (19 – 20 gram/ 100 seeds), number of pods / plant (500 - 600), big size pods (3 – 5 inch), number of seeds/pod (5 – 6) and perennial yield (1st year 12 -14 quintal/ acre and 2nd year 14 – 15 quintal/ acre) is higher as compared to the local popular variety. This variety requires less quantity of seed (4 – 5 kg/acre) and maintenance as compared to other varieties grown in the region. He won a Consolation Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002. The process is on to get the varieties developed by him registered under the PPVFRA 2001.



Improved stove with kerosene heating

Sameerul has developed a modified stove, which does not require pumping. It has a few novel features to achieve efficacy with minimum carbonaceous deposits in the burner for cleaning. The novelty lies in the placement of the cylinders and the use of the fuel heating coil that creates a liquid-gas mixture to create pressure in the tank as well as the provision of a pressure gauge and safety valve that he has provided in his stove. This stove saves fuel and also the labour involved in pumping air. It does not blacken the vessels that are placed over it.

He won a Consolation Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.



Sameerul Hasan Liyaqati
Lakhimpur Kheri





Horilal Vishwakarma
Pilibhit



Petromax based film projector

The sources of entertainment in rural villages of India are very limited especially where the penetration of televisions has not taken place. In such places, films are a big hit but the film hall owners cannot afford modern projectors, which would cost lakhs of rupees, hence the need for a cheaper alternative. Also, the irregularity of electricity and the ever increasing cost of diesel to run generators do not make it very feasible to build and own cinema halls in the rural areas.

This film projector uses a binocular lens system with scope for adjusting focal length as per the film format. The soundtrack reading is done with a specialized unit made of wood with a low cost diode, amplifier and photo-sensing circuit. There is a separate lighting box unit that sends the light from behind the main projection unit. The operating cost of the film projector is comparatively lower as running using a high powered lantern or hurricane lamp it uses less power. Further the projector also has lesser number of parts and complexity than imported machines.



Being portable and not requiring electricity, this projector can also be used by NGOs, Government departments and others to show case films relevant to their programs. He won a Consolation Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.

Can you dare to dream of crossing the English Channel on cycle: Chaurasiya can

Dwarka Prasad Chaurasiya is now in his mid seventies, but he has not yet lost his passion for innovation. He demonstrated his prowess by bicycling in sea from Nariman point to Chaupati more than two decades ago. He has also walked on water with floating shoes with a near religious zeal, pushing himself to the edge of his physical, emotional and financial capabilities.

The amphibious cycle and shoes, made by him, can help not only in removing aquatic weeds, but also in vending provisions to communities living around water bodies, have new water sports and drag things in water bodies. Chaurasiya's water walking shoes are made of a lightweight material, thermocol. The shoes, which provide sufficient buoyancy and maneuverability, are 3 feet long, 10-inches wide, and 8 inches thick. He can inspire young and old with his vivacity and commitment to pursue his dreams.



He won the State Award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007. A BBC team also covered his innovations for their program in January 2007. He has also been widely covered in different print and audio-visual media, both locally and nationally. Though his economic condition has remained precarious all this while.

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Dwarka Prasad Chaurasiya
Mirzapur





Chandrapal Singh
Basti

Improved fodder cutter

Chandrapal has developed an idea for a fodder cutter, which has greater capacity, consumes less energy and cuts fodder with great accuracy, thus proving to be a boon for farmers especially in rural areas. Unlike in commonly available machines, where the fodder has to be manually pushed, in this machine the bundles are simply placed on the feeding platform and there is no need to handle the straw manually. His machine uses serrated blades that reduce the need for sharpening thereby increasing efficiency and output. He was also supported under the Micro Venture Innovation Fund (MVIF) scheme of NIF. He won a Consolation Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.

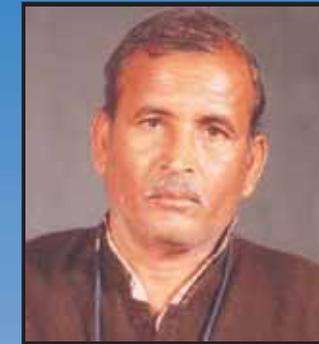


He also has many other innovative ideas and innovations to his credit like modifying a fodder cutter to make it into a threshing machine, multi-fuel engine, modified seed dibbler among others. One of his other notable innovations is the comb cum oil applicator. Generally while oiling the hair, most of the oil gets applied on the hair and little reaches the scalp. Using this comb, which has tiny holes in its teeth, oil can be applied directly to the scalp so as to nourish the hair in a better manner.

Innovative technique of using clay pellets for sowing paddy

The crop production of paddy depends on the way the seeds or seedlings are sown. Ram Abhilash Patel has developed an innovative way of sowing paddy using clay pellets. In this method, pond soil i.e. clay soil is taken and mixed thoroughly with paddy seeds. Small pellets are prepared from the mixture with each containing 3-4 seeds. These pellets can be sown manually or with the help of a seed drill but manual practice is followed, as seed drills are not available for the size of pellets.

He was appreciated in the NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.



Ram Abhilash Patel
Allahabad





**Late Niranjan Prasad
Sharma**
Pilibhit

Modified stove with kerosene heating

This stove is based on the principle of kerosene atomization. The key concept is that of pre-heating the kerosene flowing in from the cylinder thereby converting it into gaseous form. It is then fed into the burner to give a clear blue flame without any smoke, sound or deposition of carbonaceous soot on the cooking vessel. This innovation enables higher combustion of kerosene. It consumes 25 per cent less kerosene and burns with a blue flame thus eliminating smoke. In addition as there is no soot deposit on the bottom of the cooking vessel, it removes the drudgery of cleaning the sooted cooking vessels. He won a Consolation Award in NIF's Third National Competition for Grassroots Innovations and Traditional Knowledge in 2005.



Kudrat 9- An improved variety of wheat

The innovator believes that every farmer should get good quality seeds to produce high yielding varieties of crops. He has developed a number of improved wheat, paddy, mustard and pigeon pea varieties, which are high yielding, with robust stem, having bold seeds with good taste and resistance to major pests & diseases.

“Kudrat 9”, an improved wheat variety, developed by him using simple method of selection is quite popular among the farmers in different parts of Uttar Pradesh, Madhya Pradesh, Chattisgarh, Maharashtra, Rajasthan, Gujarat and some parts of Bihar, Haryana and Punjab. This variety bears large number of ear bearing tillers with lengthy spikes and has a hardy stem. The grain contains high protein and has better taste. The average yield of this variety is 55-60 quintals/hectares.



He won a Consolation Award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007. NIF has filed applications under the PPVFRA 2001 to register his pigeon pea (Kudrat 3) and wheat (Kudrat 9) variety. A few others are also in the pipeline.

14



Prakash Singh Raghuvanshi
Varanasi



Veer Dutt Bhati
Gautam Budh Nagar

Having lemons round the year

Veer Dutt Bhati has found a way to induce lemon (*Citrus limon* (L.) Burm.f.) trees to fruit throughout the year. He digs a small trench on the ground around the tree three to four times a year, and trims the fine roots around the main trunk. He mentions that this practice results in a perennial lemon harvest, rather than just twice a year yield. The overall yield of the tree reduces by a fraction, but round the year supply has its own advantage for the market as well as self-consumption. For those who have tried to store lemons would know that it is not easy to do so even if kept in a refrigerator.

Tablets for boosting productivity of crops: Vermi-compost pellet making machine

Though Nitin Kumar Tyagi is still a young man, he has already had a productive inventing career. Nitin is now pursuing his BA and operating his own business, a computer shop.

A local farmer approached Nitin with the challenge of developing a vermi-compost pellet making machine, and he is said to have completed a working model within a few months time. Vermicompost is used as an organic fertilizer and there are very few machines available in rural areas to make the pellets. It is easy to handle and applies pellets rather than powder or slurry. The process involves mixing the vermi-compost with a suitable binder (molasses), keeping it in a hopper, carrying the compost using the conveyor belt on a flat bed in the form of a sheet and passing it through the pellet-making die to generate a stream of pellets. A similar pellet making system is common in the pharmaceutical industry but its agricultural application is novel. He also has ideas about other agricultural machines and has even got a few fabricated also. He won an award in students' category in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007.



Nitin Kumar Tyagi
Meerut



Palak ki barfi

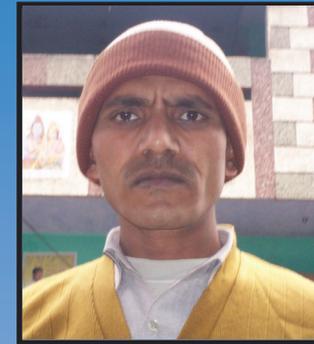
In one of the recipe competitions organised during the 18th Shodh Yatra in Laliyana village, a young girl brought a unique recipe that was never tasted before by most of the Shodh Yatris. She had made a *barfi* from spinach (*palak*) for which she was awarded the first prize. This burfi then almost became a metaphor all through the Yatra for creativity of women. She was invited to participate in the 5th (2007) and 6th (2008) Traditional Food Festival- organized by SRISTI in Ahmedabad. The response of the visitors was overwhelming and the preparation was well received.

Sarita Kumari
Baghpat

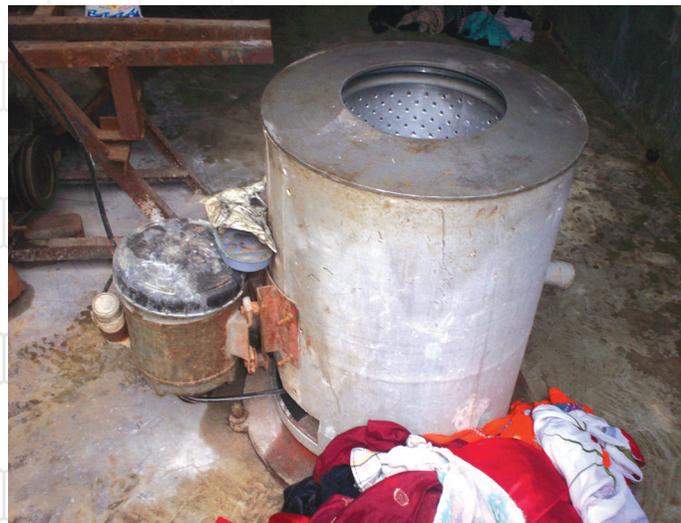
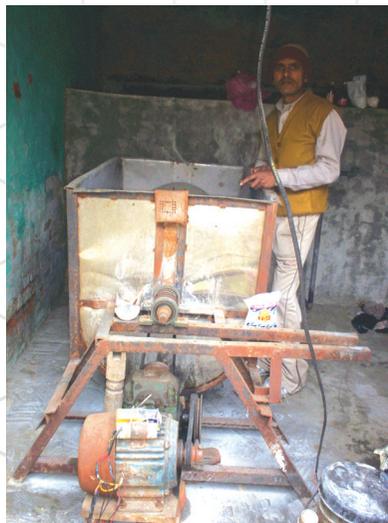


Efficient washing machine

Prithvi Singh's innovation was also discovered during the 18th Shodh Yatra. He has developed an extremely efficient washing machine, which can clean up to 100 clothes in 15 minutes. This machine is electrically operated but given the erratic behaviour of the electric supply in the region, he has incorporated features that enable it to be manually operated also.



Prithvi Singh
Baghpat



Ingenious ideas from creative minds



Air Driven Model



Rama Vishwakarna, Gazipur

Rama has developed a model of a compressed air driven engine. He has provided a DC motor powered compressor for compressing the air in the air tank. This engine is claimed to be suitable for four wheelers.

LPG Powered Engine

Hameed and Edrees Khan, Jhansi

Hameed and Edrees Khan have developed a gas kit for LPG powered engine. This gas kit is equally functional for gas as well as for petrol and switch over from gas operated mode to petrol and vice versa has been made very easy.

They are also trying to develop vehicle that could be run using compressed air.

Air Driven Engine

Rashid Parvej Khan, Jyotiba Phule Nagar

Rashid has modified a Maruti car engine enabling it to use compressed air as fuel.



Multiple Innovations



Shyam Chourasiya, Varanasi

Shyam has developed electronic gadgets that can be used to do a variety of tasks. He has developed alert systems and a small robot. He also has many ideas to develop defense related equipments.

Water level indication system

Vidit Agarwal, Lucknow

Vidit has designed a water level indication system, which does not use any external energy for its operation. It works on the principle of fluid pressure. The pressure of the water volume in the tank changes with the quantity of water in the tank, which is picked up by a balloon and a helical spring with the help of certain adjusters. The level of water in the tank is then displayed with the help of an indicator. He has been supported with the Value Addition, Research & Development grant through GIAN North for the development of a working prototype. He has also obtained a patent for this device.

Automatic Pump Operator

Siddhartha Priya Kushwaha*, Kanpur

Siddhartha has developed a water pump operating system to manage the filling of overhead tanks in houses and buildings. The device can start on its own and control the filling of the tank. It can also be operated manually. It works within an input voltage range and cuts off the electric supply if the voltage fluctuates (and also if the motor



develops some fault) thereby preventing the motor from damage. There is an option for music playback while the pump is on apart from light indicators. He has also provided a timer to allow the user to set the time for which the motor is needed to be on. He also has an idea to develop an efficient engine.

Producing Energy from Noise

Prashant Kumar, Baghpat

Anshul Goyal, Gonda

Everyday, at most places, we have to face commotion, noise and sound pollution specially on the roads, at public gatherings and functions. The two young students have given an idea to develop a machine that could convert sound into energy so that it can be reused. Though the output from such a conversion would not be great but the idea deserves merit especially when it comes from young students. Prashant's idea was documented during the ShodhYatra in the region while Anshul sent his to NIF independently.



Producing electricity from sea waves

Banpreet Singh, Lucknow

Banpreet has made a model wherein he has exhibited the process to generate electricity from sea waves and tides.

Electronic rovers



Kumar Abhishek, Sonbhadra

A young student Abhishek has developed two electronic robots that can potentially be used to explore alien surfaces, pick and drop small articles, extinguish small fire, reach places with small entrances, and as he claims can dispose off bombs as well. They have cameras that can be used to transmit images or videos.



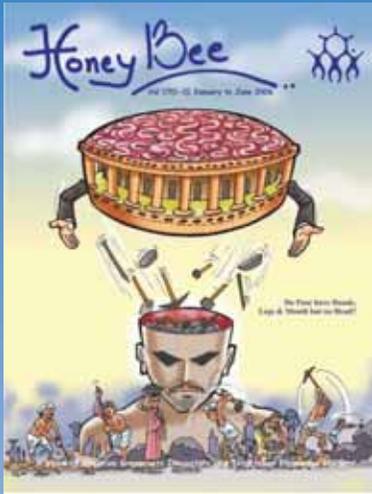
Automatic flower pot watering system and many others



Abdul Kaleem, Deoria

Abdul has a mind bustling with ideas. How many times we must have seen wilted plants/flowers in our garden due to lack of timely watering? Abdul Kaleem has developed an automatic watering system for flower pots. It senses the moisture content of the soil and automatically switches on/off the pump accordingly. He has developed numerous other devices also viz. an alarm to alert the user about a defective electrical appliance preventing him/her from receiving electric shock, a door informer which calls a pre-fed mobile number and informing the owner when an unauthorised person opens the door, a LEDs fitted map of India for use while teaching, a ceramic pot with a heating element at its base which can be used to warm mosquito repellent tablets and even for performing yagya/havans, automatic water pump controller for overhead tanks etc. NIF has provided him financial support to develop and improve some of his ideas.





Farmers' Innovations in Eastern Uttar Pradesh

Honey Bee, 3(3&4):12, 1992

1. Transplantation of Paddy vis-à-vis sowing sprouted seeds

Given the constraints in labour supply at the time of paddy transplantation, many farmers soak the paddy seeds for about 24 hours in water. Then the seeds are taken out of water and covered with cloth until they sprout. Such sprouted seeds are sown directly.

2. Climate Change and Agronomic Adaptation

Farmers have noticed changes in micro-climate that cause stress in conventional cropping systems, Pigeon-pea when sown at the conventional time or slightly later was affected adversely by heavy rains. Now farmers have started sowing it early with the help of irrigation so that crop is well established before the rains come.

3. Livestock

(a) Foot and Mouth Disease

The hoof and the mouth of the affected animals are washed with 'alum' solution. The animals are made to walk in mud twice a day which helps to control the infection or even eliminate it.

To control the foot and mouth disease (FMD) in the cattle, farmers apply hot mustard oil on the infected hoofs of the animal. The animals recover from the burning sensation soon enough while disease germs get killed by the hot oil. Honey Bee, 6(1):7, 1995



(b) Digestion/Flatulence problem

Livestock suffering from digestive disorders caused by eating rotten fodder or some other factors, are fed pure clarified butter oil (ghee). It acts as laxative and cures flatulence or other stomach disorders.

4. Controlling Weed *Cyprus rotundus* ('Motha')

Farmers spread dry pigeon peastalks in the field affected by the weed called 'Motha' (*Cyprus rotundus*) before it rains. When the rain drops trickle through the stalks on the ground the extract or washing from the stalks is supposed to suppress the weed. This method is preferred over the manual weeding.

Control of 'Gundhi bug'

Gundhi bug is a serious pest of paddy in eastern Uttar Pradesh. Farmers burn the discarded cycle tyres and walk around the field with it and later deposit it in one place close to the field. The odour of the smoke is said to repel this bug. Also, some pests, attracted by the fire, get burnt by it. This is a widespread practice in the region. Honey Bee, 6(1):7, 1995

Relief from Epilepsy

Ravi Kumar, Bulandshahar

Ravi Kumar uses powder of the rhizome of *vach* (*Acorus calamus* L.) to cure epilepsy. The powder of dry rhizome after grinding is mixed with honey or milk and given to the patient. Honey Bee, 19(1):14, 2008



१८वीं शोधयात्रा
गंगागढ़ (बुलंदशहर) से डौला (बागपत)
२६ दिसम्बर, २००६ से ३ जनवरी, २००७



18th Shodh Yatra **25th December 2006 to 3rd January 2007** **Gangagarh (Bulandshahar) to Daula (Baghpat), Uttar Pradesh**

Shodh Yatra is a walk through the villages in search of knowledge, creativity and innovations at grassroots.

It is an attempt on the part of SRISTI, a Honey Bee Network partner based at Ahmedabad and NIF along with other network partners to reach out to the remotest part of the country with a firm belief that hardships and challenges of natural surroundings may be one of the prime motivators of creativity and innovations.

Shodh Yatra aims at unearthing such traditional knowledge and grassroots innovations that have not only simplified the lives of men, women and farm labourers but have also significantly contributed towards the conservation of bio-diversity.

The yatris, during the 18th Shodh Yatra, over the period of ten days, travelled through the rural areas honouring innovators, traditional knowledge holders, experimental farmers and centenarians on the way. Many biodiversity and recipe contests were also organised at various places. The Shodh Yatra saw the participation of people from all walks of lives, students, innovators, farmers, scientists, journalists and traditional knowledge holders from different parts of the country and abroad as well. See Honey Bee, 17(4) & 18(1):23-30, 2006 & 2007 for complete Shodh Yatra report.

Keeping alive the Traditional of Knowledge: Girls share their knowledge during the 18th Shodh Yatra



Source: http://en.wikivisual.com/images/6/60/Psidium_guajava.jpg



Source: http://www.wisebread.com/files/fruganomics/imagecache/blog_image_full/files/fruganomics/blog-images/carrots.jpg



Source: http://upload.wikimedia.org/wikipedia/commons/3/36/Nerium_oleander2.jpg

Toothache

Gurgle with the decoction of *amrud* (*Psidium guajava* L.) leaves
- *Poonam Raghav, Bulandshahar*

Mouth ulcer

Chew the fresh leaves of *amrud* (*Psidium guajava* L.)
- *Poonam Raghav, Bulandshahar*

Joint pain

Boil leaves of *kaner* (*Nerium oleander* L.) in mustard oil and apply the medicated oil on the aching joint
- *Doli Sharma, Bulandshahar*

Cough

Take the juice of *anar* (*Punica granatum* L.) leaves along with black salt
- *Kirti Sharma, Bulandshahar*

Intestinal worms

Take the juice of *gajar* (*Daucas carrota* L.) orally
- *Anju Bhatnagar, Gautambudhnagar*

Eye sight

Take the juice of *gajar* (*Daucas carrota* L.) orally
- *Puja Singh, Muradabad*

Mouth ulcer

Gurgle with the juice of the aerial part of *dhaniya* (*Coriandrum sativum* L.)

- Poonam Raghav, Bulandshahar

Throat congestion

Take juice of *dhaniya* (*Coriandrum sativum* L.) leaves orally

- Poonam Raghav, Bulandshahar

Vomiting

Take equal amount of leaves of *dhaniya* (*Coriandrum sativum* L.) and mint. Prepare sauce and take it orally

- Meenu Kumari, Bulandshahar

Stomachache

Mix the fruit powder of *Jaiphal* (*Myristica fragrans* Houtt.) in lemon juice and take it orally

- Nisha Kumari, Bulandshahar

Cough/cold

Levigate the fruit of *Jaiphal* (*Myristica fragrans* Houtt.) in water and take it orally

- Pooja Rani, Bulandshahar

Gas

Levigate the fruit of *Jaiphal* (*Myristica fragrans* Houtt.) in lemon juice and take it orally

- Sandhya Pathak, Bulandshahar



Source : http://www.rimbundahan.org/environment/plant_lists/taman_sari/Myristicafragrans.jpg



Source : <http://www.hear.org/starr/images/full/starr-080117-1555.jpg>



Source : NIF database



NATIONAL INNOVATION FOUNDATION, INDIA

The Seventh National Biennial Competition for Green Grassroots Unaided Technological Innovations and Traditional Knowledge

Co-sponsors



Honey Bee Network



CSIR



SRISTI



IIM-A

The competition

The NIF, set up by Department of Science and Technology, GOI, seeks entries of unaided technological innovations and traditional knowledge developed by an individual or group comprising farmers, artisans, fishermen and women, slum dwellers, workshop mechanics, students, local communities etc., in managing natural and/or other resources. The innovations can be in machines, gadgets, implements, or processes for farm operations, household utility, transportation, energy conservation or generation, reduction in drudgery, creative use of biodiversity, development of plant varieties, generation of herbal remedies for human or animal health or developing new or any other low cost sustainable green technology related to various aspects of survival in urban and rural areas. Creative ideas for innovative technologies which have not yet been reduced to practice are also welcome. Communities developing People's Biodiversity Register (PBR) or People's Knowledge Register (PKR) are encouraged to register/link their knowledge base with the National Register at the NIF.

The awards

The best three innovations and traditional knowledge practices will be awarded Rs 1,00,000, Rs 50,000 and Rs 25,000 each in different categories. In addition, individuals and/or organizations that make extraordinary contributions in scouting grassroots innovations and traditional knowledge may also get awards worth Rs 50,000, 25,000 and 15,000 respectively besides recognition to many others. There will be several consolation prizes of Rs 10,000 each in different categories depending upon the number of entries and incremental inventiveness and potential social and environmental impact. Three most outstanding innovative ideas may be given prizes of Rs 50,000, 25,000 and 15,000 in addition to consolation prizes of Rs 5,000 each. There are special prizes for innovations by or dealing with, physically challenged people. The innovations /ideas of professionally trained

persons are not considered for award or financial support. There are special awards for journalists writing about grassroots innovations and/or traditional knowledge and creating greater awareness about NIF's missions. *The award money may be revised in due course.*

Students

Young inventors and innovators are invited to send their ideas or innovations for a special category of awards for them. These should be unsupervised, an outcome of their own creativity, without any support from their teachers or outsiders. There will be prizes worth Rs 15,000, 10,000 and Rs 7,500 for the best three entries and several consolation prizes of Rs 5,000 each in this category.

How to participate

Individuals or groups may send as many entries as they wish on plain paper providing a) genesis of the innovation and traditional knowledge b) its background and c) educational qualification and occupation, accompanied by photographs and/or videos if possible and any other information that may help in replicating the innovations/traditional knowledge. Herbal entries may be accompanied by dried plant samples to enable proper identification procedure. **The Seventh National Competition started on February 1, 2009 and entries will be accepted till December 31, 2010.** Every entry should include the **full postal address** to facilitate further communications.

Where to send entries?

National Coordinator (Scouting & Documentation), National Innovation Foundation, Bungalow No. 1 Satellite Complex, Premchand Nagar Road, Ahmedabad 380015 Gujarat
Toll Free No 1800 233 5555 Fax: (079) - 2673 1903
email: campaign@nifindia.org; www.nifindia.org

PART II

HERBAL PRACTICES & PRODUCTS

This section contains details of herbal preparations used traditionally for various ailments and products based on such traditional knowledge.



Uses of *Acacia nilotica* (L.) Del. (Babul)

NIF Database

Uses from Uttar Pradesh

Toothache

Brush the teeth with dry seed powder

- Lalit Kumar and Piyush Kumar, Bulandshahar, Uttar Pradesh

Cough

Take the pellets made from the leaves and sugar orally

- Poonam Raghav, Bulandshahar, Uttar Pradesh

Uses from other states

Mouth sores

Take bark juice orally after adding a little sugar

- Geeta Devi Kumawat, Jaipur, Rajasthan

Pneumonia

Boil paste of bark with little sugar and water. After cooling, filter it and take orally

- Chen Singh Charan, Nagor, Rajasthan

Skin crack

Pound leaves with black pepper and cow's ghee. Apply the paste on skin cracks

- Dansingh Laxmansingh Parihar, Junagadh, Gujarat

Burn

Mix the bark of the plant with mustard oil and boil it in water till it completely evaporates. Apply the preparation on affected body parts.

- Jagdish, Hissar, Haryana

Dental care

Gargle the decoction of the bark to strengthen teeth and eliminate other dental problems

- Geeta Devi Kumawat, Jaipur, Rajasthan

Abscess

Burn the fresh wood on fire and collect the fluid oozing out while burning, apply it on affected area

- Somesh Singla, Patiala, Punjab

Diarrhoea

Extract the juice of the leaves and take orally

- Omkarmal G Maur, Nagor, Rajasthan

Uses in Classical Codified Literature

Paste made from fresh leaves is applied on the forehead for headache¹; decoction of the bark is gargled to give relief from sore throat²; decoction of the bark is consumed to cure bronchitis³; and the dried bark powder is taken orally with water for diabetes⁴. Toothpaste is prepared from *Acacia* with the brand name 'Dental cream'⁵. Thirty patents have been found on its medicinal uses such as for dental plaque and gingivitis⁶.



Source: (<http://www.anbg.gov.au/cpbrtaxonomy/acacia-nilotica-cu-560.jpg>)

Uses of *Aegle marmelos* (L.) Corr. (Bel)

NIF Database

Uses from Uttar Pradesh

Fever

Take the leaf juice along with honey
- Poonam Raghav, Bulandshahar, Uttar Pradesh

Cough

Take the fruit juice orally
- Arun Kumar Pandey, Fatehpur, Uttar Pradesh

Diarrhoea

Take the fruit juice orally
- Priti Kumari, Bulandshahar, Uttar Pradesh

Skin disease

Apply the leaf juice topically
- Arun Kumar Pandey, Fatehpur, Uttar Pradesh

Intestinal worms

Take the green leaf juice orally
- Jagjit Bahadur, Sitapur, Uttar Pradesh

Uses from other states

Diabetes

Take the root juice (150ml) orally
- Maibum Lolito Meitei, Bishempur, Manipur

Vomiting

Take the decoction of root orally
- Alice Kunjachan, Idukki, Kerala

Stomachache

Grind the fresh roots along with one black pepper. Take two spoonfuls of the paste twice a day for two days
- Chhoti Devi, Udham Singh Nagar, Uttarakhand

Nasal bleeding

Apply the leaf paste on the nose
- Puran Chand, Kangra, Himachal Pradesh

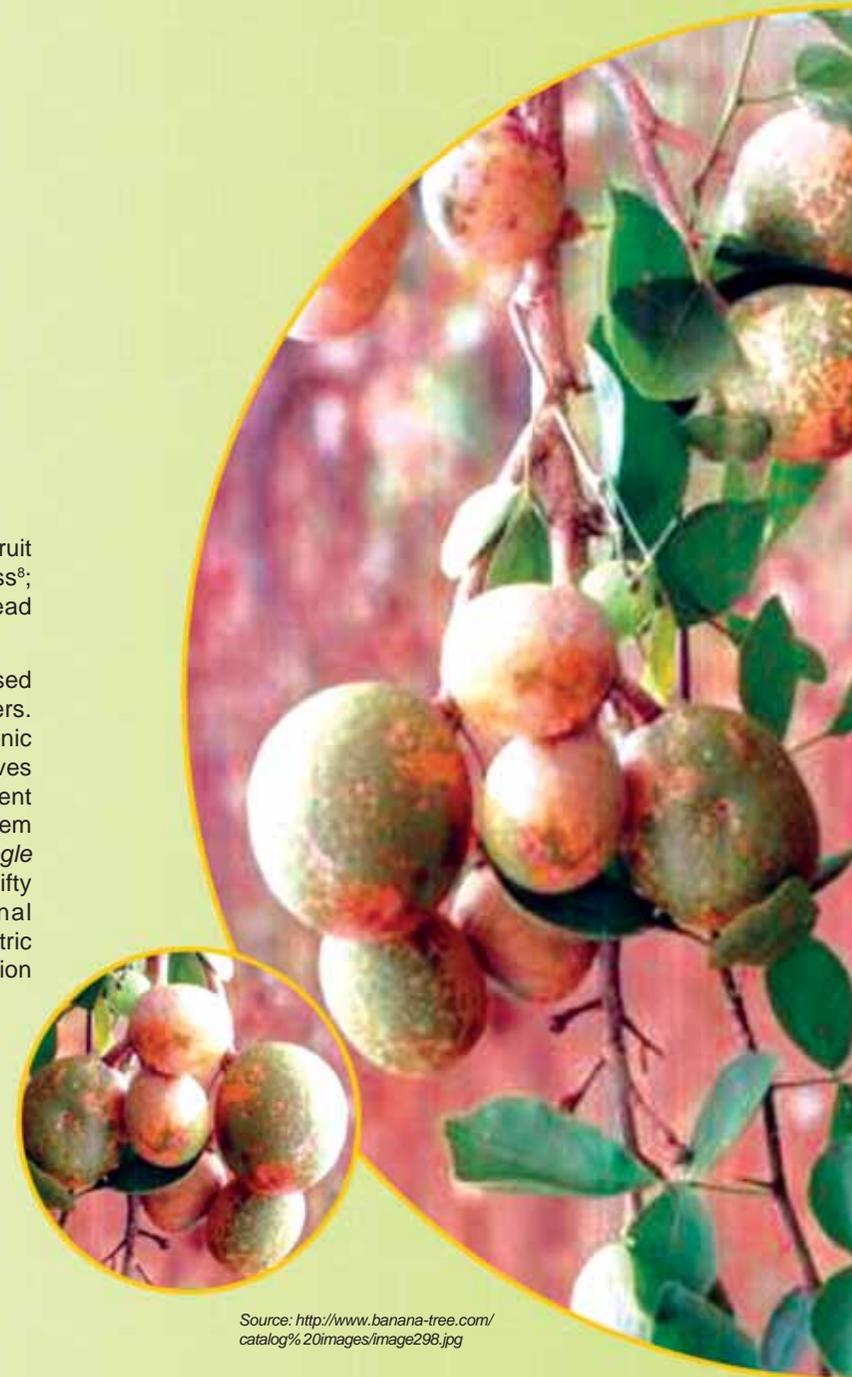
Eye diseases

Put two drops of the green leaf juice in the eye
- Kumari Nigar Pravin, Hazaribag, Jharkhand

Uses in Classical Codified Literature

Burnt fruit pulp is applied for rheumatic arthritis⁷; 10g fruit pulp is given before sleep to overcome morning sickness⁸; and fruit rind is applied externally on hair to kill head lice⁹.

Sweet fruit slices of 'Bael'⁵, prepared from *Aegle* are used in diarrhoea, dysentery and gastro-intestinal disorders. It has digestive and carminative properties. Lukol's⁵ tonic is made from this plant along with other plants. It improves uterine circulation, and its antimicrobial and astringent actions on the mucous membrane of the genital system also help control leucorrhoea. 'Bilwa'¹⁰, a product of *Aegle* is used as a medicine to cure a number of diseases. Fifty three patents have been found on the medicinal applications of *Aegle* mainly for curing diabetes¹¹, gastric ulcer¹² besides novel uses as herbal catalytic composition (US 6012417) for pollution control in automobiles.



Source: <http://www.banana-tree.com/catalog%20images/image298.jpg>

Uses of *Calotropis procera* (Ait.) R. Br. (Aak)

NIF Database

Uses from Uttar Pradesh

Toothache

Apply the latex on the aching tooth
- Kumari Pooja, Bulandshahar, Uttar Pradesh

Eczema

Apply the latex topically
- Poonam Raghav, Bulandshahar, Uttar Pradesh

Piles

Apply the leaf paste topically
- Lalit Kumar and Piyush Kumar, Bulandshahar, Uttar Pradesh

Uses from other states

Knee pain

Take the leaf juice orally
- Jyothi Bhatta, Chikmagalur, Karnataka

Earache

Put the latex in the ear to cure the pain
- R. C. Chowdhary, Nagor, Rajasthan

Stomachache

Smear mustard oil on a leaf and apply it warm over the abdomen for immediate relief
- Chawda Chanduben Jawanji, Gandhinagar, Gujarat

Arthritis

Mix latex with turmeric powder, boil it with sesame oil and then apply this paste on the aching joint
- Sanjay Singh Uplana, Nagda, Madhya Pradesh

Skin disease

Apply the bark paste on the infected part
- Muralilal, Jaipur, Rajasthan

Migraine

Heat the leaf and extract the juice. Put two-three drops in the nostril in the opposite side of the head having pain
- Indiravati Rana, Udham Singh Nagar, Uttarakhand

Uses in Classical Codified Literature

Plant extract is used as bronchodilator¹³; flower buds of *Calotropis*, along with black pepper seeds and salt, are crushed to make pills the size of small peas. Two pills are taken twice daily for three days to cure malaria¹⁴; warmed leaves, smeared with oil, are applied on the aching part to alleviate rheumatic pain¹⁵. 'Muscle & Joint Rub'¹⁵ is a highly effective ointment for backaches, muscular sprains and joint pains. 'Arkavaleha'¹⁶, made from this plant, is given to cure irritation of the stomach, nausea, vomiting, diarrhoea etc. Eight patents were found on the medicinal uses mainly for anti-tumor and antidotal activity¹⁷ and bronchial asthma¹⁸.



Source: SRISTI Database

Uses of *Carica papaya* L. (Papita)

NIF Database

Uses from Uttar Pradesh

Jaundice

Take the curry made from the unripe fruit orally
- Doli Sharma and Kirti Sharma, Bulandshahar, Uttar Pradesh

Stone

Take the root powder orally along with water on an empty stomach
- Shripal Singh, Bulandshahar, Uttar Pradesh

Stomach disorder

Eat the ripe fruit for relief
- Dimple Sharma, Bulandshahar, Uttar Pradesh

Intestinal worms

Take the dry seed powder orally
- Shabnam Kumari, Bulandshahar, Uttar Pradesh

Uses from other states

Lactagogue

Eat the ripe fruit
- Kalia Behera, Bargarh, Orissa

Cuts & wounds

Apply the leaf paste topically
- Jongam Ngemu, Papum Pare, Arunachal Pradesh

Toothache

Keep cotton dipped in the latex of the stem on the aching tooth
- Mangeram Jani, Hissar, Haryana

Intestinal worms

Take fresh latex mixed with honey orally
- Prabhat Kumar Pandey, East Champaran, Bihar

Constipation

Take fruit to get relief
- Leelamani Devarajan, Idukki, Kerala

Ringworm

Apply the milky latex on the affected area
- Mukesh Kumar, East Champaran, Bihar

Apply small fruit pieces topically

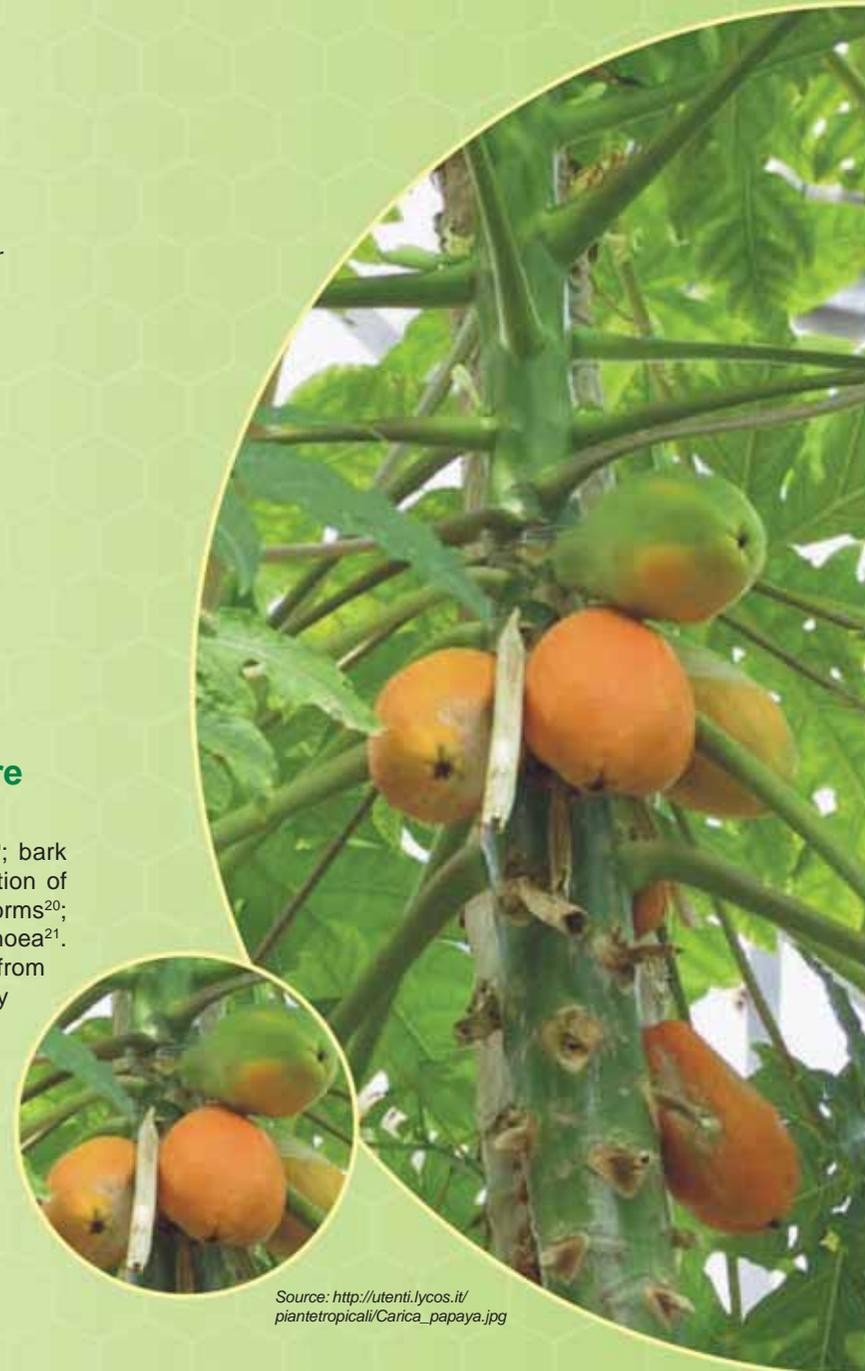
- Marykutty Thomas, Idukki, Kerala

Kidney stone

Take the root juice orally
- Sandhya Suman, Sitamarhi, Bihar

Uses in Classical Codified Literature

Decoction of the flower is used as cardiotoxic¹⁹; bark powder is applied externally on wounds³; decoction of the bark is given orally to get rid of intestinal worms²⁰; beverage of the fruit is taken orally to cure diarrhoea²¹. Natural moisturizers and creams²² are prepared from *Carica* in combination with other plants. Thirty patents were found on its medicinal uses as an anti-allergic²³ and for prevention of cancer²⁴.



Source: http://utenti.lycos.it/piantetropicali/Carica_papaya.jpg

Uses of *Cassia fistula* L. (Amaltas)

NIF Database

Uses from Uttar Pradesh

Cough

Take one spoonful of leaf powder orally
- Prem Singh, Bulandshahar, Uttar Pradesh

Muscular pain

Burn the leaves into ash and mix it with mustard oil. Apply the paste on the aching part
- Lalit Kumar and Piyush Kumar, Bulandshahar, Uttar Pradesh

Burn

Apply the leaf paste topically
- Chandbhan Singh, Bulandshahar, Uttar Pradesh

Uses from other states

Eye disease

Apply the leaf paste on the eyes
- Chinnamma, Idukki, Kerala

Ringworm

Apply the root paste on the affected area
- Kumar Chandel, Hamirpur, Himachal Pradesh

Cough

Chew the fruit skin in the morning
- Santoshben Gamar, Banaskantha, Gujarat

Stomachache

Take the fruit decoction along with jaggery orally
- Bhagwati Lal Kumawat, Chittorgarh, Rajasthan

Uses in Classical Codified Literature

Powder of dried bark is applied in case of leucoderma²⁴; fruit juice is taken in jaundice²; fruits are used as diuretic²; root powder is applied in skin diseases².

Pilex⁵(Vein care) helps support metabolic processes involved in maintaining the vascular system's integrity for optimum health and appearance; Purim⁵ (Hemo care) is used for blood purification. Six patents have been found on the medicinal applications of *Cassia fistula* including antiviral²⁵ applications.



Source: http://www.bh-froe.com/ZC/images/Cassia_fistula.jpg

Uses of *Curculigo orchioides* Gaertn. (Kali musli)

NIF database

Use from Uttar Pradesh

Take the rhizome juice orally

- Shripal Singh, Bulandshahar, Uttar Pradesh

Uses from other states

Fever

Make a paste taking equal amounts of rhizome of *kali musli* and root of *Withania somnifera* (L.) Dunal. Take one spoonful of the paste orally along with fresh unboiled milk and sugar candy

- Todu Ram, Sikar, Rajasthan

Wound

Apply the leaf paste topically

- Raghunath, Udaipur, Rajasthan

Galatogogue

Take two spoonful of the rhizome powder orally with sugar on an empty stomach

- Ramabandhu Mahajan, Jalgaon, Maharashtra

General health

Take the pellets made from the rhizome along with ghee orally

- S. Boothadhan Kanni, Tirunelveli, Tamil Nadu

Uses in Classical Codified Literature

The plant acts as an immunostimulant²⁶; the plant's rhizome is given orally to cure asthma²⁷; and it also acts as an antioxidant²⁸. 'Vigor-Forte'²⁹ is a multiherbal body tonic for rejuvenating both the body and mind. '4tify'³⁰ is a blood enriching and vitalizing tonic which improves digestion and resistance, provides nourishment to the body. Four patents have been found on its medicinal uses mainly related to treating allergy³¹ and infections³².



Uses of *Datura metel* L. (Datura)

NIF Database

Uses from Uttar Pradesh

Headache

Apply the latex on the forehead
- Rita Kumari Badhel, Bulandshahar, Uttar Pradesh

Earache

Put two drops of the plant juice in the ear for relief
- Lalit Kumar and Piyush Kumar, Bulandshahar, Uttar Pradesh

Swelling

Apply the plant juice topically
- Lalit Kumar and Piyush Kumar, Bulandshahar, Uttar Pradesh

Uses from other states

Alopecia

Juice of the leaves is extracted, smeared on the head and left for 30 minutes
- Bansi Ghosal, West Midnapur, West Bengal

Asthma

A seed soaked in water is taken orally initially, gradually a seed is increased every week for five weeks
- Rani Farhat, Hazaribag, Jharkhand

Cough

Juice from the roasted leaves is extracted; two spoonful of the juice mixed with a spoon of ghee is taken
- Mohani Kumari, Lakhisaray, Bihar

Stomachache

Warm leaves are put on the belly
- Anil Kumar Mahato, Hazaribag, Jharkhand

Diarrhoea

Seeds are ground in water, which is then filtered and administered orally
- Ajit Singh Rathod, Nagor, Rajasthan

Arthritis

Paste of the leaves is applied on the aching part
- Divakar Pathak, Lohardaga, Jharkhand

Uses in Classical Codified Literature

One fruit is filled with 10g *Piper longum* L. and burnt. About 5g of this ash is given with honey, morning and evening, for 5 days to cure malaria¹⁴; the thumb is kept inserted within the fruit to treat finger felon³³; and the root paste is applied externally on poisonous bites³⁴.

'Muscles & joint rub'¹⁵, is a highly effective medicine for backaches, muscular sprains and joint pains made from the plant. 'Unicough syrup'³⁵ is used to cure bronchitis, cough/cold and asthma.

Uses of *Eclipta alba* (L.) Hassk. (Bhangra)

NIF Database

Uses from Uttar Pradesh

Migraine

Boil equal amount of plant of *bhangra*, *pipli*, dry ginger and *tulsi* leaves in sesame oil. Apply this medicated oil on the forehead

- Arun Kumar Pandey, Fatehpur, Uttar Pradesh

Fever

Take the plant juice orally along with jaggery

- Priti Kumari, Bulandshahar, Uttar Pradesh

Cuts and wounds

Apply the plant juice topically

- Rakesh Kumar, Bulandshahar, Uttar Pradesh

Bodyache

Apply the leaf juice on the aching part

- Vijay Gupta, Muzaffarnagar, Uttar Pradesh

Uses from other states

Hair care

Apply the shoot paste on the scalp to strengthen the hair

- Rani B. Bhagat, Pune, Maharashtra

Earache

Put 1-2 drops of the fresh leaf juice in the ear

- Dipak Kumar Tiwari, Gopalganj, Bihar

Mouth sores

Chew the fresh leaves for immediate relief

- Sanjay Singh Uplana, Nagda, Madhya Pradesh

Jaundice

Take three spoonful of the plant juice orally along with sugar candy (50g) twice a day till the ailment cures

- Raghuvansh Prasad Singh, Munger, Bihar

Uses in Classical Codified Literature

Powder of dried aerial parts is used for asthma³⁶; buds ground in sesame oil are applied to the forehead to get rid from headache³⁷; and the plant is applied on ringworm lesions³⁸.

'Bhringraja'³⁹ is used as a liver tonic and for various chronic skin diseases. 'Eclipta tincture'⁴⁰, a highly effective medicine of liver ailments such as cirrhosis and infective hepatitis and other conditions involving hepatic enlargement. Thirteen patents have been found on its medicinal applications mainly for liver disorders⁴¹ and in hair care⁴².



Uses of *Ficus benghalensis* L. (Bargad)

NIF Database

Uses from Uttar Pradesh

Stomachache

Smear mustard oil on a leaf. Put lukewarm leaf over the belly for relief

- Ranveer Singh Raghav, Baghpat, Uttar Pradesh

Diabetes

Put latex in a sugar flake (*batasha*) and take it orally

- Ranveer Singh Raghav, Baghpat, Uttar Pradesh

Piles

Take the leaf juice orally

- Lalit Kumar and Piyush Kumar, Bulandshahar, Uttar Pradesh

Uses from other states

Whooping cough

Take one spoonful of the bark powder orally

- Priyanka Kumari, West Champaran, Bihar

Wound

Apply the mixture of leaf ash and coconut oil topically

- Priyanka Paramanik, Purulia, West Bengal

Sprain

Smear lukewarm bark paste on the site of the sprain

- Arun Ghosh, Bankura, West Bengal

Blisters

Apply the milky latex topically

- Omprakash Sharma, Sikar, Rajasthan

Uses in Classical Codified Literature

Aerial roots' paste mixed with salt after filtering is taken once a day in the morning for 8 days in case of diabetes⁴³; decoction of plant is applied externally on wounds and ulcers⁴⁴; latex is given orally to cure bronchitis⁴⁵.

'Anti-Dandruff shampoo'⁵, a product prepared from this plant in combination with other plants, is used to keep hair healthy and dandruff free. Product 'KLD Lotion'⁴⁶, a multiherbal ayurvedic preparation using *Ficus*, is effective in many skin ailments such as acne marks, pimples, burns - sunburns, nappy rash etc. 'Litina'⁴⁷, a herbal toothpaste made from this plant along with other plants, is good for the gums and the teeth. Four patents have been found on medicinal applications of *Ficus* for antitumor⁴⁸ medication, wound healing⁴⁹ etc.



Source: NIF database

Uses of *Ficus racemosa* L. (Gular)

NIF Database

Uses from Uttar Pradesh

Abscess

Apply the fresh latex topically

- Chandbhan Singh, Bulandshahar, Uttar Pradesh

Dysentery

Take the leaf juice orally

- Poonam Bhardwaj, Bulandshahar, Uttar Pradesh

Skin crack

Apply the latex topically

- Krishna Kumari, Bulandshahar, Uttar Pradesh

Wound

Boil the leaves in water along with butter till the solution becomes thick. Apply this medicated solution topically

- Kavita Kumari, Bulandshahar, Uttar Pradesh

Uses from other states

Mouth sores

Apply the latex on sores

- Aarti Kumari, Gopalganj, Bihar

Jaundice

Mix two drops of the latex in a glass of water. Take it in the morning on an empty stomach for seven days

- Sheikh Javed & Sheikh Mohammad, Hingoli, Maharashtra

Gynaecological disorder

Take the leaf juice orally

- Satyanarayan Sain, Sikar, Rajasthan

Poisonous bite

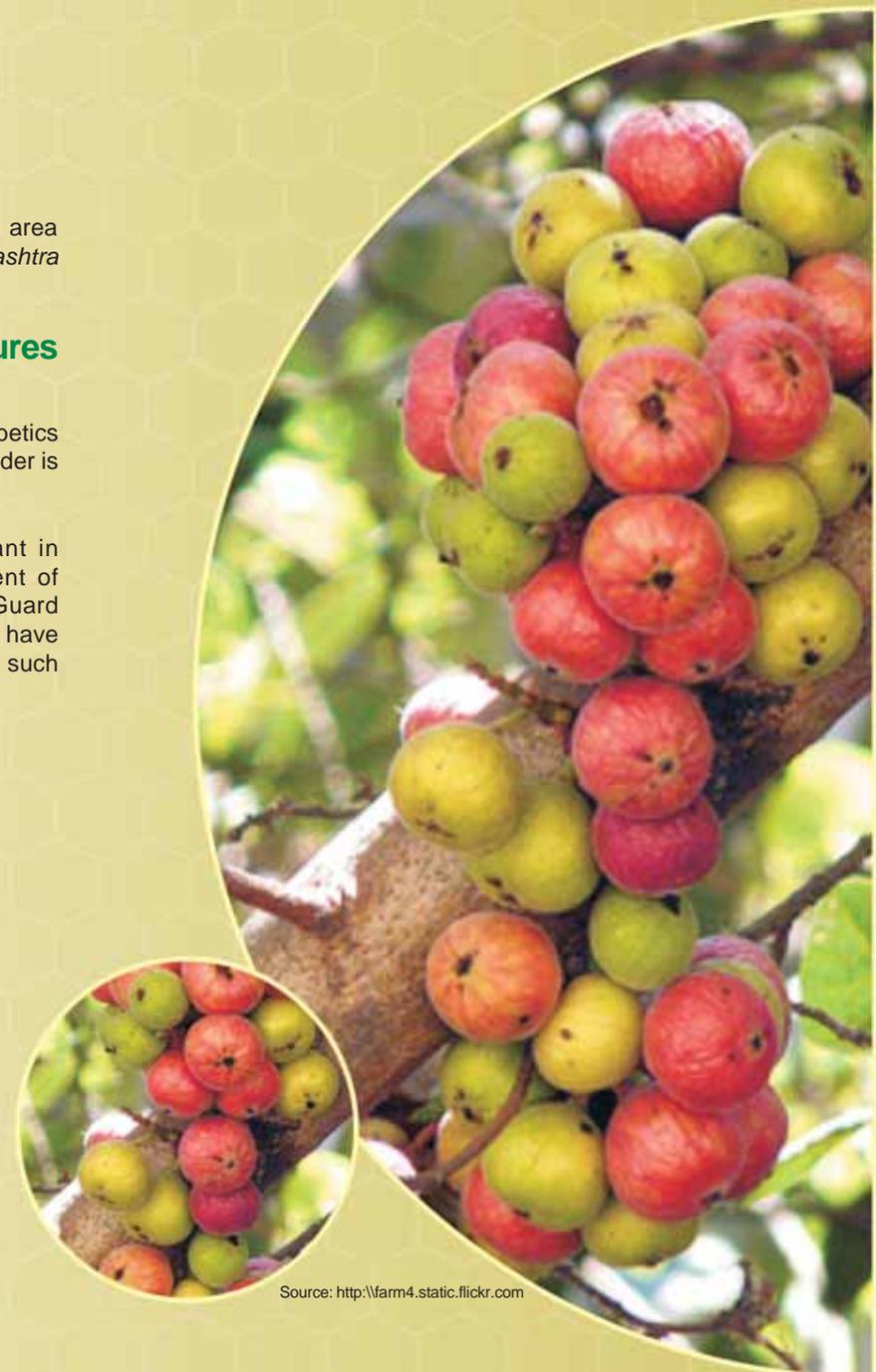
Massage crushed tender leaves over the affected area

- Ganesh Madhukar Shanbhag, Sholapur, Maharashtra

Uses in Classical & Codified literatures

Dried bark is given orally to cure diarrhoea⁵⁰; diabetics should take the decoction of roots⁵¹; dried root powder is administered orally to combat fever⁵².

Product 'Tricawin'⁵³ is prepared from this plant in combination with others herbs for the treatment of specific and non-specific leucorrhoea. 'Diabet Guard Capsules'⁵⁴ is used to cure diabetes. Fifty patents have been found on its various medicinal applications such as to treat stomach ulcer.⁵⁵



Source: <http://farm4.static.flickr.com>

Uses of *Mangifera indica* L. (Aam)

NIF Database

Uses from Uttar Pradesh

Toothache

Brush the teeth with the leaf ash
- Divakar Bhardwaj, Bulandshahar, Uttar Pradesh

Sunstroke

Take the juice of unripe roasted fruit orally
- Doli Sharma and Kirti Sharma, Bulandshahar, Uttar Pradesh

Indigestion

Take the fruit juice orally along with ginger powder
- Omshankar Kumar, Bulandshahar, Uttar Pradesh

Diarrhoea

Roast the pulp of unripe fruit, add sugar and take it orally
- Poonam Raghav, Bulandshahar, Uttar Pradesh

Uses from other states

Asthma

Take one spoonful of powder of roasted mango seeds orally twice a day
- Narsabhai Bhagabhai Bubadiya, Sabarkantha, Gujarat

Stomachache

Take a cup of the juice of roasted fruit along with sugar
- Akash Kumar Jha, Sitamarhi, Bihar

Diarrhoea

Abrade the seed of mango and tamarind (*Tamarindus indica* L.) on stone. Make a paste and take it orally
- Hiralal Gonda, Dungarpur, Rajasthan

Dysentery

Take one spoonful bark powder orally
- Gamaliyal Hembrom, Hazaribag, Jharkhand

Uses in Classical Codified Literature

Bark decoction is given orally to cure diarrhoea⁵⁶; decoction of leaves and bark is given orally to cure pain and aches⁵⁷; and bark of the plant acts as an appetizer⁵⁸. 'Wildcrafted Angel's Touch Hand Crème'²², a herbal cosmetic product, is formulated to restore rough and reddened hands and to keep them velvety and soft.²² 'Mensta'⁵⁹, a multi-herb drug, acts as uterine support and is the first non-hormonal menstrual modulator with spasmodic activity. Fourteen patents have been found on its various medicinal uses such as for treating gastrointestinal disorders⁶⁰ and for hair growth⁶¹.



Uses of *Sphaeranthus indicus* L. (Gorakhmundi)

NIF database

Uses from Uttar Pradesh

Headache

Apply the flower paste on the forehead
- Tarun Suri, Muzaffarnagar, Uttar Pradesh

Ache

Apply the flower juice on the aching part
- Tarun Suri, Muzaffarnagar, Uttar Pradesh

Bodyache

Apply the flower juice on the body
- Tarun Suri, Muzaffarnagar, Uttar Pradesh

Uses from other states

Headache

Take two spoonful of the leaf juice orally
- Vilas Shantaram Patil, Jalgaon, Maharashtra

Weakness

Take the decoction of the whole plant orally
- Bhimsingh Thakur, Sivni, Madhya Pradesh

Fever

Take two spoonful of the leaf juice orally
- Vilas Shantaram Patil, Jalgaon, Maharashtra

Stomachache

Chew the fresh leaves for immediate relief
- Vilas Shantaram Patil, Jalgaon, Maharashtra

Obesity

Take the juice of flowering heads (100ml) with milk (100ml) orally
- Susila Vaidy, Vellore, Tamil Nadu

Uses in Classical & Codified literature

Extract of the dried aerial parts is taken to get rid of indigestion⁶²; juice of the fresh leaves is mixed with little amount of milk and sugar and consumed to combat cough⁶²; and the plant acts as a diuretic⁶³. Product 'Diabecon'¹⁵ minimizes long-term diabetic complications. 'Geriforte'¹⁵ facilitates respiratory functions, and assists cardiovascular functions. Six patents have been found on its various medicinal applications mainly on inflammatory disorders⁶⁴ and cancer⁶⁵.



Uses of *Terminalia arjuna* (Roxb. ex. DC.) Wt. & Arn. (Arjun)

NIF database

Uses from Uttar Pradesh

Cardiac disorder

Mix the bark powder in the fried leaves or flower of China rose and sugar and take it orally
- Arun Kumar Pandey, Fatehpur, Uttar Pradesh

Respiratory disorder

Take the bark powder orally along with honey
- Pokhpal Singh, Bulandshahar, Uttar Pradesh

Blood pressure

Take the bark powder orally
- Kuldeep Singh and Mohar Singh, Bulandshahar, Uttar Pradesh

Uses from other states

Cardiac disorder

Take one cup of the tea made from bark powder on an empty stomach
- Mahesh Bijarania, Nagor, Rajasthan

Gynaecological disorder

Boil the bark of *arjun*, *ashoka* (*Saraca asoca* (Roxb.) Wild.) and *babul* (*Acacia nilotica* (L.) Willd. ex Del.) (100g each) in a litre of water till the solution remains one-third. Take a spoonful of the decoction orally twice a day
- Tarachand Goswami, Lohardanga, Jharkhand

Anaemia

Take the decoction of bark, leaf and fruit orally
- Gobardhan Netam, Dhamtari, Chhattishgarh

Bodyache

Chew the tender bark
- Mohammad Shoaib, Gopalganj, Bihar

High blood pressure

Take one cup of the decoction of bark on an empty stomach for 21 days
- Pusaram Sahoo, Durg, Chhattisgarh

Tuberculosis

Take the bark decoction orally
- Pyarelal Dixit, Jabalpur, Madhya Pradesh

Uses in Classical & Codified Literature

Decoction of the bark is administered orally to get relief from chest pain⁶⁶; bark powder is taken to combat diabetes⁶⁷; and the paste of bark along with leaves of night jasmine is applied externally to cure injuries⁶⁸. Product 'Abana'¹⁵ regulates serum lipids by lowering the cholesterol and thus improves the contractility of the heart. 'Arjuna'⁶⁹ promotes effective cardiac functioning and regulates blood pressure. Seven patents have been found on its medicinal uses mainly on cancer⁷⁰ and hyperlipidemia⁷¹.



Source: http://farm1.static.flickr.com/201/517713786_6e7d8014d6.jpg?v=0

Uses of *Tinospora cordifolia* (Willd.) Miers ex Hk. f. & Th. (Giloy)

NIF Database

Uses from Uttar Pradesh

Fever

Take the leaf juice orally
- Mohit Kumar, Bulandshahar, Uttar Pradesh

Cough

Take the plant juice orally
- Sakshi Sharma, Meerut, Uttar Pradesh

Jaundice

Take the plant decoction orally
- Ranveer Singh Raghav, Baghpat, Uttar Pradesh

Rheumatism

Mix the plant (25g), dry ginger (5g) and sesame oil (5g), soak in water overnight. Take the filtered solution next morning
- Jagjit Bahadur, Sitapur, Uttar Pradesh

Uses from other states

Gastric problem

Take the stem decoction along with ginger powder once a day
- Sanjay Singh Uplana, Nagda, Madhya Pradesh

Typhoid

Take the decoction or powder of the stem orally
- Yanueg Jamoh Lego, East Siang, Arunachal Pradesh

Asthma

Take two spoonful of the leaf juice orally with honey for 40-42 days
- Ramabandhu Mahajan, Jalgaon, Maharashtra

Diabetes

Take leaf powder (¼ spoon) regularly
- Patel Singh, Hissar, Haryana

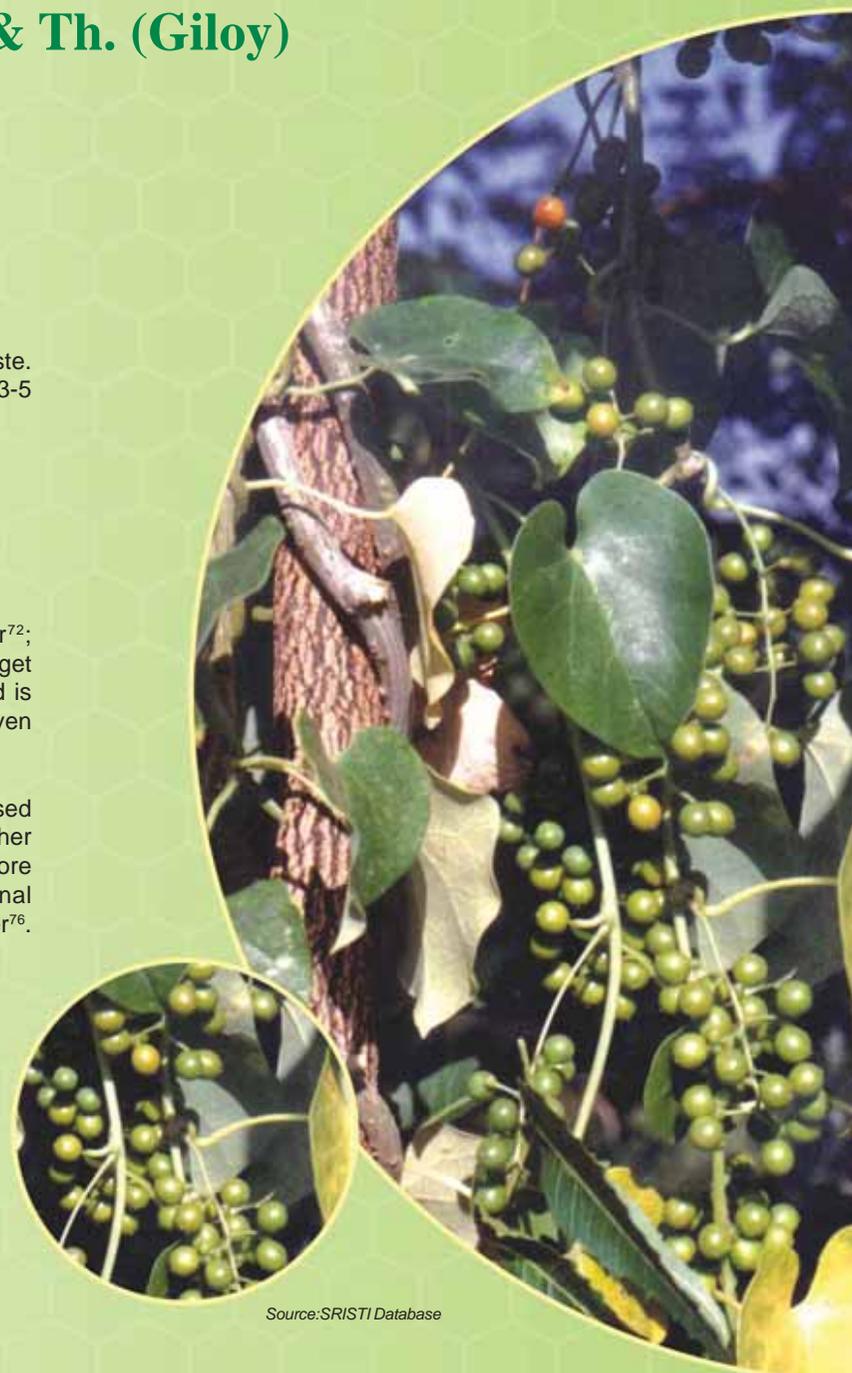
Piles

Boil, dry and grind the whole plant (50g) into a fine paste. Make tablets and take one tablet thrice a day for 3-5 days
- Pukhram Angouba Singh, Bishnupur, Manipur

Uses in Classical Codified Literature

Powdered roots are taken to cure mouth ulcer⁷²; powdered plant is administered orally with honey to get relief from stomach disorder⁷³; the stem is bitter and is used as anthelmintic²; and decoction of the plant is given orally to cure diarrhoea⁷⁴.

Tinospora is a well known medicinal plant and is used to cure a number of diseases in combination with other plants with brand names 'Geriforte, Diabecon'¹⁵ etc. More than a hundred patents were found on its medicinal applications mainly as an antiallergic⁷⁵ and for cancer⁷⁶.



Source:SRISTI Database

Uses of *Tridax procumbens* L. (Rukhdi)

NIF database

Use from Uttar Pradesh

Abscess

Apply the plant paste topically
- Santosh Badhel, Bulandshahar, Uttar Pradesh

Uses from other states

Malaria

Take the decoction of an equal amount of the leaves of *rukhdi*, *tulsi* and *neem* orally
- Vinay Yadav, Jaipur, Rajasthan

Diarrhoea

Take the leaf juice along with buttermilk
- Sahil Bansal, Sikar, Rajasthan

Cuts & wounds

Apply the leaf paste topically
- Ramdas Ghanshyamdas Patel, Nasik, Maharashtra

Gynaecological disorder

Take the juice of an equal amount of the leaves of *rukhdi*, *sisham* (*Dalbergia sissoo*) and *dub grass* (*Cynodon dactylon*) orally
- Mukesh Kumar Saini, Sikar, Rajasthan

Uses in Classical Codified Literature

The leaf juice is given to lower blood sugar level⁷⁷; the plant juice is given orally to cure hepatitis⁷⁸; and the plant is used for all types of inflammation⁷⁹. 'Polyherbal cream'⁸⁰ is an effective medicine mainly used to treat various kinds of wounds. Five patents have been found on its medicinal uses mainly for treating skin disorders⁸¹.



Source: http://farm1.static.flickr.com/38/120816909_38c838b70b.jpg

Promotion of knowledge based enterprises and lateral markets

National Innovation Foundation in association with regional collaborator Peermade Development Society, Idukki, Kerala initiated a massive campaign through women self help groups to mobilize knowledge, innovations and practices among women. In this exercise more than ten thousand traditional knowledge practices were documented (many were quite common) from the field of cosmetics, nutraceuticals, health care, cooking etc., from just one block of a district in Kerala. This exercise has indicated the immense potential of knowledge at the grassroots, which can be converted into products and viable enterprises for augmenting livelihood options for rural women.

Initially four products having commercial potential were taken up for enterprise development. All knowledge holders of the four products were constituted as a single SHG named Amala and SSI registration was done. Nutrient supplement, baby massage oil and incense stick are the products selected for the initial intervention. The products were tested and standardized. All products were made available in the market under the brand name SAHYA.

The products were formally launched on August 11, 2007 in an auspicious function, attended by large number of women including the innovators. Amala enterprise was supported through the MVIF scheme of NIF.



Herbal Formulations for Healthy Crops

SRISTI SHASTRA

Arkhiben Vankar, Ranabhai Kamaliya, Banidan Gadhvi, Gemal Rana, Rajnikant Patel, Ahmadbhai Kadivala, Gujarat.

It flourishes the growth of the plant by increasing flowering as well as fruiting. Besides overall vegetative growth, it is not harmful to nature and human beings. It also controls sucking pests like white fly, heliothis, aphid etc.

SRISTI KRUSHAK

Popatbhai Rupabhai Jambucha, Gujarat

It is an excellent remedy for leaf curl disease. Besides controlling the disease it increases the vigor of the plants by increasing overall growth.

SRISTI SURAKSHA

Community Knowledge, Gujarat

It is a very efficient treatment for termite and acts as a vitaliser to the affected crops. To control termites the herbal formulation is mixed with sand and spread in the field. Some times it is released in the field along with the flow of irrigation water. In some cases, it is also drenched in the affected part of the plant and sprayed on the vegetation to repel termites.

SRISTI PRAYAS

Community Knowledge, Gujarat

It is a highly effective formulation to act as a herbal growth promoter, which stops shedding of flowers as well as increases the overall growth of the plant. This formulation strengthens the plants internally and enables them to withstand extreme weather conditions. Constant use of this formulation increases the yield and reduces the toxic content in our daily diet.

SRISTI SHAKTI

Community Knowledge, Gujarat

A herbal growth promoter, which helps in production of excellent quality organic food grain. Constant use of this formulation not only increases the yield but also reduces the toxic contamination in our food and environment.



Herbal Formulations for Livestock and Poultry~



Coccicure

Sudakarbhai K. Gaudi & Jeevalbhai M. Gaudi, Dang, Gujarat

It is a unique herbal medication for prevention and curing of Coccidiosis (*Eimeria* sp infections) in Poultry. The primary function of the medication is to reduce the oocytes maturation and affects the life cycle of various *Eimeria* species.

Poultmax

Community knowledge, Valsad, Dang, Gujarat

It is a unique herbal medication for promoting poultry immunity. It cures symptoms like greenish diarrhoea, conjunctivitis, nasal sputum, drop in egg production and respiratory distress in poultry. About 30g/100 birds for 0-4 weeks & 60g/100 birds for 4-8 weeks may be administered for seven days in stress or for three days before and three days after expected stress.

Mastiherb

Ukhardiyabhai S. Raot, Dang, Gujarat

Mastiherb is a unique intramammary herbal medication for curing mastitis in animals. Clinical trials indicated efficacy of the medication over subclinical mastitis; clinical mastitis and chronic mastitis. It was also validated in case of mastitis due to *Staphylococcus aureus*. The dose rate was found to be single intra mammary infusion for minimum three days after adequate standardization.



~These formulations are based on traditional knowledge of farmers and developed by Sadbhav-SRISTI Sanshodhan Laboratory (www.sristi.org). These products are licensed to Matrix Biosciences Pvt. Ltd, Hyderabad, Andhra Pradesh. The benefits are shared with the knowledge providers, communities, nature, those who add value and other stakeholders in the knowledge and value chain.



IGNITE 09 - The National Students' Competition

IGNITE is a national competition of ideas and innovations of school children organized by NIF. It is open till August 31, 2009. The awards will be announced on October 15, 2009, the birthday of Hon'ble former President of India, Dr. A.P.J. Abdul Kalam; celebrated as Children's Creativity and Innovation Day. The awards will be given by Dr. Kalam at his convenience soon after. Those who can not submit entries till August can submit later also for the next annual competition.

NIF will provide support for patenting and incubating innovative projects in all deserving cases. All school going children up to class XII of any school (and even out of school) can participate in the competition either by sending their entries through post to our address mentioned below or through email at ignite09@nifindia.org (For more details, please log on to www.nifindia.org).

Children can submit entries in any or all of these categories: a) ideas of technologies not yet developed, b) innovative products developed by the students (does not matter if these are crude or just proof of concept), c) problems identified in their neighborhood with which we have lived for long without solving them, and d) traditional knowledge practices learned from elders. Please note that the projects guided by teachers/parents will not be accepted.



Co-sponsors



Honey Bee Network



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SRISTI



IIM-A

IGNITE 2009

National Innovation Foundation,
Bungalow No 1, Satellite Complex
Prem Chand Nagar Road,
Ahmedabad 380 015
ignite09@nifindia.org
www.nifindia.org

PART III

INNOVATIONS

for UTTAR PRADESH

This section contains details of national innovations, which are deemed suitable for introduction in U P





Arvindbhai Patel
Gujarat

Auto air kick pump

This innovation is a low cost, portable, compact aid to inflate tyre tubes/punctures of any vehicle having kick start or auto start mechanism so as to fix the problem on the spot and enable the rider to reach the nearby gas station or repair shop. This device uses the engine as the compressor for pumping air into the tube. A pinch of polymer granules is also inserted in the tube to seal the leakage in the tube.

Arvindbhai won a National Award in NIF's Second National Competition for Grassroots Innovations and Traditional Knowledge in 2002. NIF, apart from filing a patent in his name, facilitated sales of a few hundred pieces to customers in Assam and Arunachal Pradesh through dealership technology licensing and local entrepreneurs. The technology is available for licensing to entrepreneurs in different states.



The natural water cooler

We already have refrigerators that operate on the principle of heat transfer and earthen pots that work on the principle of evaporation to cool water today. Arvindbhai has combined both features. In his natural water cooler, water is passed through cotton string covered copper coils, which are continuously being moistened by a dripper. Evaporation of water from lining on the coil cools the water inside. Cool water without electricity, isn't it a nice idea!





N Sakthimainthan
Tamil Nadu

Hand operated water lifting device

An efficient way of pumping water to meet requirements in a cost effective way is always a challenge in rural India.

Developed from locally available materials, this hand operated water lifting device is simple in design, delivers high discharge and is low cost compared to conventional hand pump, bucket pump, and bicycle operated pumps.

He received a Consolation award in NIF's Fourth National Competition for Grassroots Innovations and Traditional Knowledge Practices in 2007. NIF also filed a patent for this device in the innovator's name. The Innovation has been taken up for value addition at CMERI Durgapur (WB) through the NIF-CSIR JIC Fellowship Scheme.



Earthen kitchen products

Tawa/pan

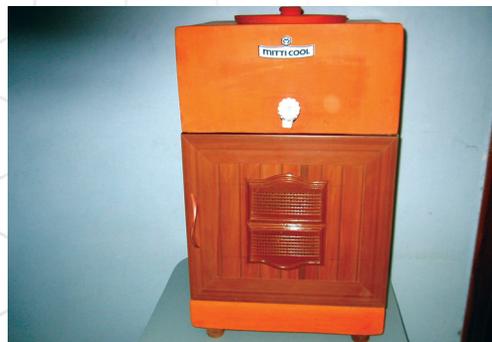
Non stick tawas have become an essential part of our kitchens to prepare low oil food but are costly. Their non stick coating also doesn't last long. Blending traditional and modern technology, Mansukhbhai has developed a clay tawa with a black non-stick food grade coating. Being non-metallic, the rotis, dosas and other items cooked on it give a different taste and feel altogether.

Mitticool

A fridge for the common man that does not require electricity and keeps food fresh too. With this basic premise in mind Mansukhbhai came up with Mitticool, a fridge made of clay. It works on the principle of evaporation. Water from the upper chambers drips down the side, taking heat from the inside gets evaporated, leaving the chambers cool. Cool and affordable, this is the option to keep food, vegetables and even milk fresh naturally for days.



Mansukhbhai Prajapati
Gujarat





A. Muruganandam
Tamil Nadu

Sanitary napkin making machine

Sanitary napkins, a universally needed product, have a very low penetration in India due to high price and the traditional trend of using cheaper but unhygienic old cloth pieces. The innovator has developed a machine that produces quality sanitary napkins at a low cost.

One can prepare sanitary napkins with industry standard raw materials while cutting down the cost in production. It requires three to four persons to produce two pads per minute. Costing less than half of conventional options, this machine produces sanitary pads @ Rs.1 to Rs. 1.50 per pad approximately.

The innovator prefers to sell the napkin making machinery only to self-help groups of women. He has also designed a napkin vending machine such that one can put a coin and get a pad. With the support from the Micro Venture Innovation Fund scheme of NIF, the innovator has been able to install over fifty units in seven states.



An improved dual pod variety of chick pea- “Sushil Laxmi”

The most distinctive feature of the variety is that it bears two pods per axil as compared to single pod per axil, which is a common feature of all the varieties that are available in the market. Plant is tall (50-60cm), spreading and has bushy type growth habit. Foliage is dark green and seeds are attractive, bold (25-30 gram/100 seeds) and brown in colour. The variety has been reported to be tolerant to wilting and insect pest attack in farmer’s field, yielding on an average 14 - 16 quintals per acre under irrigated conditions and 12 - 13 quintal per acre in unirrigated conditions.



Balasaheb Patil
Maharashtra





Raghav Gowda
Karnataka

Manual milking machine

Safe milking of cows/buffaloes is a requirement across rural India and this product is an efficient step in that direction. It is a low cost, manually operated device that helps farmers to milk the animal hygienically and also reduces drudgery in the process.

The machine has simple controls and can be easily operated by women as well. The creation of suction and low vacuum makes it suitable for other applications also. NIF has been giving marketing support to the innovator. As a result, this machine has also been sold to customers in Phillipines, Uganda and Ethiopia apart from India.



Aloe vera gel extractor

The innovator has developed an effective multipurpose unit capable of pulverizing, steaming, and extraction of gel for herbal applications.

With this device, the innovator uses the specially designed pressure cooking chamber to extract the essence from *Aloe vera*. Being a compact portable unit, it can be quickly and easily transported and used anywhere, to process herbs and deliver on demand. The present machine has a capacity to process 100 kg of *Aloe vera* per hour. The innovator was supported for production and commercialisation through GIAN North from the Micro Venture Innovation Fund at NIF. One unit has been sent to Kenya on a pilot basis for application feasibility study in the country.



Dharamveer
Haryana





Amrutbhai Agrawat
Gujarat

Aaruni-the tilting bullock cart

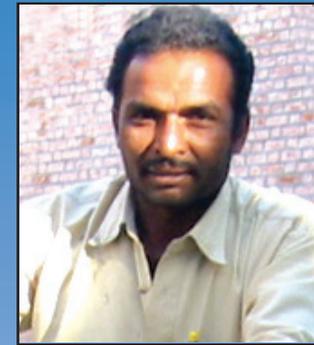
In a traditional bullock cart, with two wheels, part of the load is borne by the draft animals on their shoulders and neck. Moreover, the harnessing system makes it difficult to negotiate sharp bends or turns in the road. This causes galls on the neck of the bullocks, which affects not only the efficiency of the animals but also their stamina. This cart is thus designed to overcome the shortcomings of the traditional carts by having an extra wheel to balance the load. In addition, the cart has a tilting mechanism that is based on the rope and pulley system, which can be controlled by a lever located alongside the cart driver.



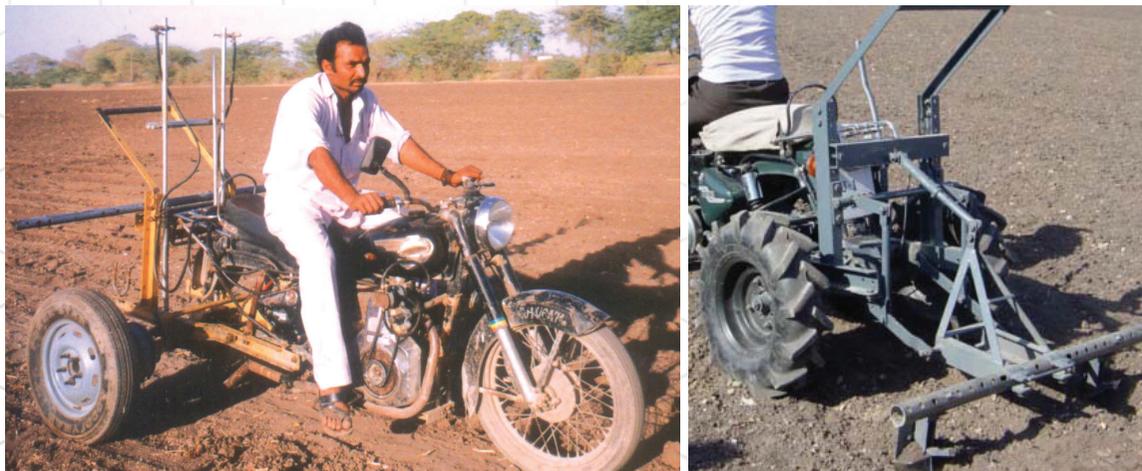
Bullet Santi-motorcycle based multipurpose plough

Like other drought prone regions, Amreli region, from where the innovator belongs, has severe labor shortage, few farm animals or mechanized implements to conduct farming operations. To address this need, the innovator designed a unique unit: the 'Bullet Santi'.

Using the chassis, drive and power of an Enfield Bullet motorcycle, the innovator has retrofitted an attachment with two wheels at the rear with a tool bar to fit various farm implements. This helps in ploughing, weeding and sowing seeds. Being a unique local solution, the machine has proved to be cost effective and fuel efficient. Bullet Santi can plough an acre of land in half an hour consuming only two litres of fuel. Innovator got a patent in India and USA. Given the fact, many other users and innovators copied this technology, he has appreciated the concept of 'Technology Commons' implying no restrictions for other innovators to copy and adapt. But commercial firms will need license from members of the 'Technology Commons'.



Mansukh Bhai Jagani
Gujarat





Dulal Choudhary*
Kamrup

Production of soft *muga* silk

The innovator has mechanised the process of *muga* silk weaving by way of making modifications in the conventional mechanised loom. *Muga* silk weaved with the device becomes soft as well as blocks UV radiations up to 80 % as per laboratory tests at Tezpur University.

The innovator has made various products like shirts, belts, caps etc. with the *muga* weaved from this loom. He has also made an umbrella out of this material which is durable, stain free, and water proof. It has a pleasing golden shine which illuminates colour, better than that offered by conventional umbrellas.

NIF had facilitated the technology transfer of this *muga* umbrella to Assam Silk Development Centre.



*As per its mandate, NIF does not consider such professionals for awards or financial support, but only helps in providing visibility or linkages.

Mobile operated switch and multi-media poster

Imagine a village where the farmer has the luxury of being able to stay at home and switch his irrigation pump in the faraway field on or off as required during the day or at night. This is made possible by this innovation, which uses the power of mobile telephony to trigger electrical control switches.

The farmer can remotely know the status of the pump in his cell phone and turn the motor on or off by calling the particular configured number. It activates the switching by certain number of rings and hence incurs no call charges. Prem Singh has developed several other innovations, one of which is the viewer triggered multi-media poster. If any agency wants to communicate some graphic message with different language audios or videos, this multi-media poster can be very useful. NIF facilitated a Mumbai based company to purchase two hundred units of the talking poster worth around eight lakh rupees for diffusion in various states. These were made available in five local languages.



Prem Singh Saini
Haryana





Rajkumar Rathore
Madhya Pradesh

An improved variety of pigeon pea- “Richa 2000”

This variety has coloured big flowers, long leaves and bunchy type pod bearing at the top. Topping is done periodically, which results in bushy growth. This variety has synchronous maturity with higher yield (24 quintals/acre), more branches / plant (12-14) and more pods/plant (700 – 800) than other local popular varieties of the region.



Herbal growth promoter

A herbal plant growth promoter, which is effective in protecting the plants from a broad spectrum of pests apart from providing necessary nutrition has been developed. It is named as “*Kamaal*” meaning wonderful, due to its performance. It is effective in field crops as well as in vegetable crops.

The main ingredients of the product are “*aak*” (*Calotropis gigantea*), “*reetha*” (*Sapindus trifoliatus*), “*dhatura*” (*Datura metel*), “*neem*” (*Azadirachta indica*), Tobacco (*Nicotiana tabacum*), and “*bhang*” (*Cannabis sativa*), etc.

The innovator won a Consolation Award in NIF’s Fourth National Competition for Grassroots Innovations and Traditional Knowledge in 2007. He has also been supported under the Micro Venture Innovation Fund of NIF for commercialising “*Kamaal*”. The product is a good hit in the local market and is fetching steady income for the innovator. This product has also been supplied for use in the gardens in the Rashtrapati Bhavan with encouraging results.



Ishwar Singh Kundu
Haryana

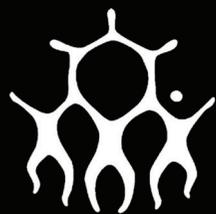


End Notes & References

- 1) Anis, M. and Iqbal, M. 1994. Medicinal plantlore of Aligarh, India. *Int. J. Pharmacog.* 32 (1): 59-64.
- 2) Prajapati, N.D., Purohit, S.S., Sharma, A.K. and Kumar, T. 2007. *A Handbook of Medicinal Plants*. Jodhpur, Agrobios (India), Section-II, pp. 1-554.
- 3) Jain, S.K. 1991. *Dictionary of Indian Folk Medicine and Ethnobotany*. New Delhi, Deep Publications, pp. 1-311.
- 4) Jain, S.R. and Sharma, S.N. 1967. Hypoglycaemic drugs of Indian indigenous origin. *Planta. Med.* 15 (4): 439-442.
- 5) Himalaya healthcare products, <http://www.himalayahealthcare.com/products.htm> downloaded on 02.09.2008.
- 6) Behl, H.M., Sidhu, O.P., Mehrotra, S., Pushpangadan, P. and Singh, S.C. 2006. *Nontoxic dental care herbal formulation for preventing dental plaque and gingivitis*. CSIR, New Delhi. (United States Patent No.7083779 dt. 01.08.2006; <http://patft.uspto.gov>, downloaded on 21.11.08).
- 7) Reddy, M.B., Reddy, K.R. and Reddy, M.N. 1989. A survey of plant crude drugs of Anantapur district, Andhra Pradesh, India. *Int. J. Crude Drug Res.* 27(3): 145-155.
- 8) Bhattarai, N.K. 1994. Folk herbal remedies for gynaecological complaints in Central Nepal. *Int. J. Pharmacog.* 32(1): 13-26.
- 9) Shrivastava, R.K. 1985. Aegle marmelos: An Ipso Facto plant of India. *J. Res. Edu. Ind. Med.* 4(3/4): 21-25.
- 10) Bazar of India herbal products, <http://www.bazaarofindia.com/productsnew.asp?pid=100K38&catid=BC&subcatid=CL>, downloaded on 04.08.2008.
- 11) Pushpangadan, P. and Dhan, P. 2006. *Herbal nutraceutical formulation for diabetics and process for preparing the same*. CSIR, New Delhi. (Pat no. 7014872 dt. 21.03.2006; <http://patft.uspto.gov>, downloaded on 20.08.2008).
- 12) Rao, J.M., Sampathkumar, U., Sastry, B.S., Yadav, J.S., Raghavan, K.V., Palit, G., Rai, D., Varier, P.M., Muraleedharan, T.S. and Muraleedharan, K. 2003. *Composition for treating gastric ulcer and a process for preparing the same*. (Pat no. 20030180398 dt. 25.09.2003; <http://www.freepatentsonline.com>, downloaded on 20.08.2008).
- 13) Al-Yahya, M.A. 1986. Phytochemical studies of the plants used in traditional medicine of Saudi Arabia. *Fitoterapia.* 57(3): 179-182.
- 14) Anis, M. and Iqbal, M. 1986. Antipyretic utility of some Indian plants in traditional medicine. *Fitoterapia.* 57(1): 52-55.
- 15) Sebastian, M.K. and Bhandari, M.M. 1984. Medico-ethno botany of Mount Abu, Rajasthan, India. *J. Ethnopharmacol.* 12(2): 223-230.
- 16) Herbalcure India, <http://www.herbalcureindia.com/herbs/arka.htm>, downloaded on 17.11.2008
- 17) Kiss, R. 2005. *Extract with anti-tumor and anti-poisonous activity*. Unibioscreen S.A., Belgium (Pub no. MXPA05003634 (A) dt. 14.12.2005; <http://v3.espacenet.com>, downloaded on 21.11.2008).
- 18) Muthuswamy, M.P. 2003. *Polyherbal composition for the treatment of Bronchial Asthma and the process*. Dalmia C.T. for Res and Dev (IN) and Murali Panchapagesa Muthuswamy (IN). (Pat no. WO03055558 dt.10.07.2003; <http://v3.espacenet.com>, downloaded on 20.08.2008).
- 19) Duke, J.A. and Vasquez, R. 1994. *Amazonian Ethnobotanical Dictionary*, CRC Press, Boca Raton. p. 181.
- 20) Coee, F.G. and Anderson, G.J. 1996. Ethnobotany of the Garifuna of Eastern Nicaragua. *Econ. Bot.* 50(1): 71-107.
- 21) Gupta, M.P., Arias, T.D., Correa, M. and Lamba, S.S. 1979. Ethnopharmacognosic observations on Panamanian medicinal plants. Part I. *Q. J. Crude Drug Res.* 17(3/4): 115-130.
- 22) Wild crafted herbal products, <http://www.wildcrafted.com.au/> downloaded on 22.08.2008.
- 23) Agarwal, R.K. and Agarwal, A. 2004. *Herbal composition having antiallergic properties and a process for the preparation thereof*. Bangalore, Natural Remedies Pvt. Ltd. (Pat no. 6730332, dt. 04.05.2004; <http://patft.uspto.gov>, downloaded on 23.08.2008).
- 24) Morimoto, C. and Dang, N.H. 2006. *Compositions for cancer prevention, treatment, or amelioration comprising papaya extract*. (Pub no. WO/2006/004226 dt. 12.01.2006; <http://www.wipo.int/pctdb/en/wo.jsp>, downloaded on 23.08.2008).
- 24) Reddy, M.B., Reddy, K.R. and Reddy, M.N. 1988. A survey of medicinal plants of Chenchu Tribes of Andhra Pradesh, India. *Int J Crude Drug Res* 26(4): 189-196.
- 25) Hozumi, T., Matsumoto, T., Oyama, H., Nanba, T., Shiraki, K., Kurokawa, M., Hattori, Y. and Kadota S. 1994. *Galenical drug-containing antiviral agent*. Showa Shell Sekiyu, Nanba Tsuneo and Shiraki Kimiyasu (Pat no. JP6025003 dt. 01.02.1994; <http://v3.espacenet.com>, downloaded on 04.11.2008).
- 26) Lakshmi, V., Pandey, K., Puri, A. Saxena, R. P. and Saxena, K.C. 2003. Immunostimulant principles from *Curculigo orchioides*. *Journal of Ethnopharmacology*. ISSN: 0378-8741, V-89: pp. 181-184.
- 27) Pandit, P., Singh, A., Bafna, A.R., Kadam, P.V. and Patil, M.J. 2008. Evaluation of antiasthmatic activity of *Curculigo orchioides* Gaertn. rhizomes. *Indian J. Pharm. Sci.* 70: pp. 440-444.
- 28) Venukumar, M.R. and Latha, M.S. 2002. Antioxidant activity of *Curculigo orchioides* in carbon tetrachlorideinduced hepatopathy in rats. *Indian Journal of Clinical Biochemistry.* 17(2): pp. 80-87.
- 29) Herbs Forever Inc. <http://www.satveda.com/product.asp?plD=32&c=44453>, downloaded on 2.07.2009.
- 30) Tradeindia, <http://www.tradeindia.com>, downloaded on 2.07.2009.
- 31) Guorang, H. 2000. *Herbal compositions and uses for the treatment of allergic reactions*. Hu Guorang, Australia. (Pub. No. WO0059520 (A1), dt. 12.10.2000; <http://v3.espacenet.com>, downloaded on 2.07.2009).
- 32) Liang, K.C., Covina, C.A. and Liang, L. 2002. *Herbal suppositories*. Sheldon & Mak, Canada. (Appl. No. 20020031559, dt.14.03.2002; <http://appft1.uspto.gov>, downloaded on 2.07.2009).
- 33) Alam, M.K. 1992. Medical ethnobotany of the Marma tribe of Bangladesh. *Econ. Bot.* 46 (3): 330-335.
- 34) Selvanayahgam, Z.E., Gnanaveendhan, S.G., Balakrishna, K. and Rao, R.B. 1994. Anti snake venom botanicals from ethnomedicine. *J. Herbs Spices Med. Plants* 2 (4): 45-100.
- 35) Universal Medikit, <http://www.umkit.com/Herbal%20products.htm>, dt. 29.08.2008.
- 36) Panthong, A., Kanjanapothi, D. and Taylor, W.C. 1986. Ethnobotanical review of medicinal plants from Thai traditional books, Part 1: plants with anti-inflammatory, anti-asthmatic and antihypertensive properties. *J. Ethnopharmacol.* 18 (3): 213-228.
- 37) Nagaraju, N. and Rao, K.N. 1990. A survey of plant crude drugs of Rayalaseema, Andhra Pradesh, India. *J. Ethnopharmacol.* 29 (2): 137-158.
- 38) Girach, R.D., Aminuddin, Siddiqui, P.A. and Khan, S.A. 1994. Traditional plant remedies among the Kondh of district Dhenkanal, Orissa. *Int. J. Pharmacog.* 32 (3): 274-283.
- 39) <http://www.ayurvedicure.com/bhringraja.htm>, dt. 21.08.2008.
- 40) <http://www.tropilab.net/ecliptatincture.htm>, dt. 21.08.2008.
- 41) Mehrotra, R., Katiyar, C.K. and Gupta, A.P. 2000. *Hepatoprotective compositions and composition for treatment of conditions related to hepatitis B and E infection*. Dabur Research Foundation, Ghaziabad. (Pat no. 6136316 dt. 24.10.2000; <http://patft.uspto.gov>, downloaded on 21.08.2008).

PART III : INNOVATIONS FOR UTTAR PRADESH

- 42) Pushpangadan, P., Pal, M., Dixit, B.S., Banerjee, R. and Rao, Ch.V. 2007. *Herbal dye and process of preparation thereof*. CSIR, New Delhi. (Pat no. 6136316 dt. 24.10.2000; <http://patft.uspto.gov>, downloaded on 21.08.2008).
- 43) Singh, K.K. and Maheshwari, J.K. 1994. Traditional phytotherapy of some medicinal plants used by the Tharus of the Nainital district, Uttar Pradesh, India. *Int. J. Pharmacog.* 32(1): 51-58.
- 44) John, D. 1984. One hundred useful raw drugs of the Kani tribes of Trivandrum forest division, Kerala, India. *Int. J. Crude Drug Res.* 22(1): 17-39.
- 45) Singh, V.K., Ali, Z.A., Zaidi, S.T.H. and Siddiqui, M.K. 1996. Ethnomedicinal uses of plants of Gonda district forests of Uttar Pradesh, India. *Fitoterapia* 67(2): 129-139.
- 46) Depsonpharma, http://www.depsonspharma.com/ayurvedic_herbal_products_kldlotion.htm, downloaded on 05.11.08.
- 47) Litna, <http://www.litna.com/company2.htm>, downloaded on 05.11.08.
- 48) Bassa, B.V. 2003. *Antitumor agent*. Biozak, Inc., San Jose, Canada. (Pat no. 6660309 dt. 09.12.2003; <http://www.freepatentsonline.com> downloaded on 08.11.2008).
- 49) De Souza, A. 2005. *A herbal composition having potent antimicrobial and wound healing properties*. Mehta, D.S., Vaidya, R.A., Vaidya, A.B. and De Souza, A. Michel Apartment, Mumbai. (Pat no. WO/2005/115090 dt. 08.12.2005; <http://www.freepatentsonline.com>, downloaded on 8.11.2008).
- 50) Wasuwat, S. 1967. A list of Thai medicinal plants, ASRCT, Bangkok. Research Report, *A.S.R.C.T., no.1 on research project 17*: p. 22.
- 51) Kar, A., Choudhary, B.K. and Bandyopadhyay, N.G. 1999. Preliminary studies on the inorganic constituents of some indigenous hypoglycaemic herbs on oral glucose tolerance test. *J. Exp. Bot.* 64 (2): p. 179-184.
- 52) Mokkhasmit, M., Ngarmwathana, W., Sawasdimongkol, K. and Permiphat, U. 1971. Pharmacological evaluation of Thai medicinal plants. *J. Med. Ass. Thailand.* 54 (7): p. 490-504.
- 53) <http://www.dabur.com/en/search/welcome.asp?q=tricawin>, downloaded on 07.01.2009.
- 54) <http://www.allayurveda.com/db/salableproducts.asp?currentPage=4>, downloaded on 07.01.2009.
- 55) Pushpangadan, P., Venkateswara, R.C., Raghavan, G., Mehrotra, S. and Nair, R.K. 2008. *Method for treating stomach ulcers with herbal extract composition*. CSIR, New Delhi, India. (Pat no. 7,438,932, dt. 21.10.2008; <http://patft.uspto.gov>, downloaded on 22.12.2008).
- 56) Akendengue, B. 1992. Medicinal plants used by the Fang traditional healers in Equatorial Guinea. *J. Ethnopharmacol.* 37 (2): 165-173.
- 57) Coe, F.G. and Anderson, G.J. 1996. Screening of medicinal plants used by the Garifuna of Eastern Nicaragua for bioactive compounds. *J. Ethnopharmacol.* 53: 29-50.
- 58) Gill, L.S., Akinwumi, C. 1986. Nigerian folk medicine: practices and beliefs of the Ondo people. *J. Ethnopharmacol.* 18 (3): 259-266.
- 59) <http://www.mapsofindia.com/sponsors/pearl-distributor/general-health-care.html>, downloaded on 11.06.2009.
- 60) Pushpangadan, P., Rao, C.V., Singh, R.A.K., Mehrotra, S., Ojha, S.K. and Amresh. 2005. *Herbal composition for gastrointestinal disorders*. CSIR, New Delhi. (Pub. No. WO2005063271 (A1), dt.14.07.2005; <http://v3.espacenet.com>, downloaded on 11.06.2009).
- 61) Kohno, K. 2008. *Agent for hair growth*. Kohno Kenji, Japan. (Pub. No. EP1915997 (A1), dt.30.04.2008; <http://v3.espacenet.com>, downloaded on 11.06.2009).
- 62) Garg, S.C. and Kaseera, H.L. 1983. *In vitro* antibacterial activity of the essential oil of *Sphaeranthus indicus* L. *Fitoterapia.* 54 (1): 37-39.
- 63) Sahu, T.R. 1984. Less known uses of weeds as medicinal plants. *Ancient. Sci. Life.* 3 (4): 245-249.
- 64) Chauhan, V., Suthar, A., Sapre, D., Bal-Tembe, S., Gangopadhyay, A.K., Kulkarni-Almeida, A. and Parikh, S.H. 2007. *Herbal composition for inflammatory disorders*. Nicholas Piramal India Ltd., India. (Pub No. WO2007036900, dt.05.04.2007; <http://v3.espacenet.com>, downloaded on 23.02.2009).
- 65) Mitra, S.K., Saxena, E., Dixt, M.N., Uddagiri, V.B., Marikunte, V.R., Mathad, S.A. and Shanbhag, S.V. 2006. *Novel anticancer agent, methods for obtaining the same and pharmaceutical compositions thereof*. MMI Corp., India. (Pub No. WO2006134609, dt.21.12.2006; <http://v3.espacenet.com>, downloaded on 23.02.2009).
- 66) Dwivedi, S. and Agarwal, M.P. 1994. Antianginal and cardioprotective effects of *Terminalia arjuna*, an indigenous drug, in coronary artery disease. *J. Ass. Phys. India.* 42 (4): 287-289.
- 67) Kumar, D.S. and Prabhakar, Y.S. 1987. On the ethnomedical significance of the Arjun tree, *Terminalia arjuna* (Roxb.) Wight & Arnot. *J. Ethnopharmacol.* 20 (2): 173-190.
- 68) Rathore, A., Juneja, R.K. and Tandon, J.S. 1989. An iridoid glucoside from *Nyctanthes arboristis*. *Phytochemistry* 28 (7): 1913-1917.
- 69) <http://www.divineremedies.com/aujuna-capsules.htm>, downloaded on 17.02.2009.
- 70) Khanuja, S.P.S., Gupta, M.M., Srivastava, S.K., Kumar, T.R., Singh, D., Verma, S.C., Garg, A., Khan, M., Verma, R.K., Mishra, R.K. and Singh, S.C. 2007. *An improved process for the isolation of Arjunic acid from the bark of the tree Terminalia arjuna and the use of this compound in the treatment of cancer*. CSIR, New Delhi, India. (Pub No. WO2007060684, dt.31.05.2007; <http://v3.espacenet.com>, downloaded on 20.02.2009).
- 71) Tripathi, Y.B. 2008. *Polyherbal preparation for the prevention of atherosclerosis and hyperlipidemia*. Department of Biotechnology, New Delhi and Banaras Hindu University, Varanasi, India. (Pat No.7,416,743, dt.26.08.2008; <http://patft.uspto.gov>, downloaded on 20.02.2009).
- 72) Singh, V.K. and Ali, Z.A. 1992. A contribution to the ethnopharmacological study of the Udaipur forests of Rajasthan, India. *Fitoterapia* 63 (2): 136-144.
- 73) Nagaraju, N. and Rao, K.N. 1990. A survey of plant crude drugs of Rayalaseema, Andhra Pradesh, India. *J. Ethnopharmacol.* 29(2): 137-158.
- 74) Gupta, S., Yadava, J.N.S. and Tandon, J.S. 1993. Antisecretory (antidiarrhoeal) activity of Indian medicinal plants against *Escherichia coli* enterotoxin-induced secretion in rabbit and guinea pig ileal loop models. *Int. J. Pharmacog.* 31 (3): 198-204.
- 75) Pushpangadan, P., Rao, Ch.V., Rawat, A.K.S., Ojha, S.K. and Reddy, G.D. 2008. *Anti-allergic herbal formulation*. CSIR, New Delhi. (Pat no. 7344739 dt. 28.12.2004; <http://patft.uspto.gov> downloaded on 22.10.2008).
- 76) Solanki, R.S. 2003. *Herbal formulation*. Sahajanand Biotech Private Ltd, India. (Pub no. GB2378384 dt. 12.02.2003; <http://v3.espacenet.com>, downloaded on 23.10.2008).
- 77) Bhagwat, D.A., Killedar, S.G. and Adnaik, R.S. 2008. Anti-diabetic activity of leaf extract of *Tridax procumbens*. *Int. J. Green Pharm.* 2: pp.126-128.
- 78) Hemalatha, R. 2008. Anti-hepatotoxic and anti-oxidant defense potential of *Tridax procumbens*. *Int. J. Green Pharm.* 2008 2: pp.164-169.
- 79) Mishra, P., Akhtar, S. Ali, M., Sharma, P.K. and Patil, U.K. 2008. Evaluation of anti-inflammatory potential of *Tridax procumbens* extract in rats. *The Indian Pharmacist.* ISSN 0972-7914, Vol.7: pp.111-113.
- 80) Rusan Pharma Ltd., <http://www.rusanpharma.com>, downloaded on 06.07.2009.
- 81) Prakash, V.R.D., Bhamidipalli, S.S., Sistla, R. and Kondapuram, V.R. 1999. *A herbal formulation useful as a therapeutic and cosmetic application for the treatment of general skin disorders*. CSIR, New Delhi. (Pub. No. EP0923937 (A2), dt.23.06.1999; <http://v3.espacenet.com>, downloaded on 06.07.2009).



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