Van Sangyan

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Note to Authors:
We welcome the readers of Van Sangyan to write to us about their views and issues in forestry. Those who wish to share their knowledge and experiences can send them:
by e-mail to vansangyan_tfri@icfre.org
or, through post to The Editor, Van Sangyan,
Tropical Forest Research Institute,
PO-RFRC, Mandla Road,
Jabalpur (M.P.) - 482021.

The articles can be in English, Hindi, Marathi, Chhattisgarhi and Oriya, and should contain the writers name, designation and full postal address, including e-mail id and contact number.
TFRI, Jabalpur houses experts from all fields of forestry who would be happy to answer reader’s queries on various scientific issues. Your queries may be sent to The Editor, and the expert’s reply to the same will be published in the next issue of Van Sangyan.

Cover Photo: Panoramic view of Achanakmar-Amarkantak Biosphere Reserve
Photo credit: Dr. N. Roychoudhury and Dr. Rajesh Kumar Mishra, TFRI, Jabalpur (M.P.)
From the Editor’s desk

In many areas where people are engaged in farming today, wildlife is responsible for causing damages to both livestock and crops, thus affecting human economy. In India, crop damage by wild boar is very common along the immediate peripheries of wildlife sanctuaries and national parks. But there are several areas in and around human habitations on the outskirts of villages, towns and cities where they also do considerable damage to crops, vegetable fields and orchards. This man-animal conflict is mainly due to the conversion of forests into large-scale monoculture plantations, shifting cultivation, overgrazing, forest cutting, and encroachment in the home ranges, which reduces the availability of natural food to wild animals.

Farmers use many methods to protect their fields and orchards from wild boars. These include patrolling the fields, watchdogs, fencing, guns, potash bombs, etc. The most commonly used crop protection strategy used by 71% of the farmers is constant vigilance. About 20% use dogs to chase the wild boars away, while the remaining 9% resort to more dangerous methods like shotguns, potash bombs and high voltage electrical current, which usually kills or seriously injures the animals. Another method commonly used by farmers is to construct fences out of the thorny twigs and branches of Prosopis juliflora, Acacia nilotica, Ziziphus nummularia, Z. mauritiana and Euphorbia caducifolia. However, despite all these crop protection measures, wild boars still manage to invade the crop fields.

For successful protection, it would require that people be in the fields throughout the day during the seasons when the crops are most vulnerable. Obviously this is not possible because the farmers have other work to do. In some instances, 4 or 5 farmers jointly hire a person or persons (depending on the farmer group) to guard their crop fields. This practice is the most economical and also more successful among the crop protection strategies.

This issue of Van Sangyan contains an article on Indian wild boar and their management in agriculture. There are also useful articles, such as Outbreak of scrabid beetles in Tendu leaves and its control (in Hindi), Some plant nacrotics and their harmful effects (in Hindi), Abnormal seedlings of Holoptelea integrifolia Planch. (in Hindi), Adathoda vasica in curative disorders, Manjari green: shaving brush of wild flowers, Diversity of macro-fungi in central India, Clarkeinida trachodes, Harmful insects and losses (in Hindi), Azima tetracantha - An ethanobotanical plant with biocidal properties from Andhra Pradesh, Control of air pollution by some plants (in Hindi), Human identification and fingerprints and Biodiversity of Dromaius novaehollandiae and Thevetia peruviana.

I hope that readers would find all information in this issue relevant and valuable. Van Sangyan welcomes articles, views and queries on various issues in the field of forest science.

Looking forward to meet you all through forthcoming issues.

Dr. N. Roychoudhury
Scientist G & Chief Editor
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Indian wild boar and their management in agricultural field

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Abstract
Nowadays, wild boar creates lot damage to agricultural crops nearby forest fringes. Sometimes it causes injurious attack and also spreading diseases to the human being. Only some Indian states allows the killing of wild boars with conditions. This may lead to lot of wildlife crime and also extinction of species. In these context, there is need to control the wild boars from the damaging the crops. This article explains various simple controlling methods from crop damage.

Introduction
The Indian wild boar (Sus scrofa) is one of the intelligent and widely spread large mammals in Asia, Europe and Africa. It has capable of quick colonies the newer areas due to their fast breeding, nocturnal and omnivorous in nature. So, it has easily adoptable to the human altered landscapes like agro-ecosystems for their food and shelter requirement (Shafi and Khokhar, 1986). In recent years, there is an increased depredation of agricultural crops throughout their growing period by wild boars (Rao et al., 2015). This may be due to the increase of wild boar population, changes in the land use pattern, habitat fragmentation, decline of natural predators and increased human pressure in their natural habitat.

Besides damaging the agricultural crops, it also spreads infectious diseases and also injuries to human which leads to development of antagonistic attitude among the people (Chauhan et al., 2009; Akhadeet al., 2015). To reduce damages, there is urgent need to either control or kill the population of wild boar. But, the schedule III of Indian Wildlife Protection Act of 1972 restricts the hunting or wounding of wild boar (some of the Indian states were allows to killing of animal with conditions). Sometimes killing of these animals may leads to extinction of species. So there is a need to control the menace without killing of wild boar’s population. This paper captures some of effective controlling method which would be easily adoptable in the agricultural fields. In some times, adoption of single method will be ineffective or inadequacy where farmers can adopt the combination of these methods.

Controlling methods
Fencing
Farmers can establish the fences around the field. It is one of the expensive methods which will effectively control the wild boar. The fabricated mesh is held close to the ground. This is supported by the steel or wooden or stone post with 1-1.5 m height.

Solar fencing method will be more effective than conventional method. Solar electric fencing uses the DC (Direct current) which is non-lethal to wild boar. However, fences are periodically repaired.

Repellents
Wild boars are very sensitive to the smell. Spraying the offensive odour causing substances like pig dung, pig oil, pig urine and chilli powder etc. on the crops around the field for once in a week. Burning of substances in the earthen pots will cause
fumes. It will also causes irritate the wild boar so it won’t enter into the filed.

**Erection of coloured cloth**
The different coloured cloths are fixed along and across the field. This will look like presence of human in the field which will restricts the wild boars entering into the field. White coloured cloth would be more effective than other colours. Though it is not possible in all situations, it has some effectiveness in the human movement.

**Fixing the frighten items**
Frightening items such as white or red colored ribbons or plastic strips can be fixed in a crisscross and also around the field by using wood post. These frightening items should have light weighted flying and flashing would be more effective. It would scare away the wild boars by producing sounds as well as flashes.

**Lure plants**
Planting of thorny species like *Agave americana*, *Agave sisalana*, *Acacia nilotica*, *Commiphora cordata*, *Euphorbiaturucalli*, *Euphorbiatortilis*, *Opuntia striata*, *Prosopis juliflora*, *Zizyphus spp*, etc. as a live fence around the field will effective control. Live fences should be maintaining a height of 1.5 -2 m. If live fences are broken it should be tightly packed with more thorns. Some irritating crops like chilies around the field also control the wild boar.

**Snares**
Injury-less snares can be made in locally. These snares should be placed in usual or frequent entrances of wild boar in an agricultural field. The entangled animal makes alarm calls which deter away the other wild boars thereby saving the entire crop without any damage. This method will be more effective but care should be taken in order avoid legal punishing.

**Creation of sound and light**
While damaging the crops by the wild boar, use of scaring elements like fire crackers, bon firing, making loud sounds and beating the empty tin or drums will irritate the animal. This method will effectively control the animal from damaging the crops.

**Use of dogs**
Normally farmers who are living around the forest fringes area would have dogs. They can train these dogs in order to make either sound or scaring away the wild boar. It is one of the simplest methods to control menace of wild boar.

**Patrolling**
The group of farmers can as a team. They can go for team patrolling during the active time of wild boar. This method would be effective control the wild boar menace. However, in most of time farmers can’t find time.

**Conclusion**
Under the prevailing socio-economic and political framework, there is need to create awareness and proper education to the various stakeholders. Farmers can be avoid crops which are highly susceptible to the wild boar damage. Various ways of elimination or population controlling methods should be experiments in affected areas. Government can pay some compensation for the damages by the wild boars. Sometimes insurance companies government and other financial institutions can initiate the insurance like financial to the affected farmers.

**Reference**
तेन्दू पत्तों में नियमक-स्क्रैपराविक बीटल का प्रक्रोप एवं नियंत्रण उपाय

ज. पी. बी. मेथाम एवं एं. डॉ. एं. कुलकर्णी

वनकीट प्रमाण

उष्णकटिबंधीय वन अनुसंधान संस्थान

(भारतीय वाणिज्य अनुसंधान एवं विकास परिषद, वन और जलवायु परिवर्तन मंत्रालय, भारत सरकार)

जबलपुर

तेन्दू पत्तियों का उपयोग अवसारिक रूप में बीड़ा बनाने के काम में आता है। इन पत्तियों का अन्ध्रा स्बाद होने के कारण बीड़ों के उद्घोषण व उत्पादण में इसका उपयोग होता है। नवरत्न वनोपज में इसका सरकार को काफी मात्रा में राजस्व प्राप्त होता है। अद्वितियाँ को भी इसमें बड़ी मात्रा में रोजगार प्राप्त होता है।

इस महत्वपूर्ण प्रजातियों की कई प्रकाण के कीड़ों का प्रक्रोप होता है। इसमें पती खाने वाले कीड़ का प्रक्रोप भी होता है, लेकिन इस वर्ष बदलते वातावरणीय के परिपेक्ष में पतों में धरातल करने वाले कीड़ों का प्रक्रोप अधिक मात्रा में मध्यप्रदेश महाराष्ट्र, उत्तरप्रदेश राज्यों के अनेक बन मण्डलों में पाया गया है।

हाल ही में मध्यप्रदेश के कटनी बन मण्डल एवं उत्तरप्रदेश के कांटी बन मण्डल में भी जानकारी के अनुसार यह पाया गया है कि, तेन्दू पत्तियों को कोलिंगोट्या गण के क्रेनारिंड कुल के कीटों के व्यथक (भूगम्प) द्वारा खाया गया है। यह भूगम्प (बीटल) रात में तेन्दू के लाल एवं हरी सुनायम पत्तियों को गोल-गोल काटकर नसों को छोड़कर खाते रहते हैं। दिन के समय में वे बीटल पत्तियों में दिखाई नहीं देते हैं। इन बीटलों का रंग मुख्यतः हल्का भूरा एवं लाल काला होता है, एवं इनकी भाग शारीर प्रजातियाँ पायी जाती हैं। इन कीटों का प्रक्रोप मई से जुलाई तक रहता है। इनके प्रक्रोप से तेन्दू पत्ता के संग्रहण के लिए अन्ध्र क्षेत्र में पत्तिया नहीं मिल पाती है। और तेन्दू पत्ता के संग्रहण में इसका काफी प्रभाव पड़ता है एवं राजस्व प्राप्ति में भी काफी प्रभाव पड़ता है।

अप्रैल-मई माह में कभी-कभी अलं क्षेत्र में आक्रामक वर्ष की बीड़ाओं का कारण बीटल मिट्टी एवं जर्मन पर पत्ती सूखी पत्तियों में से रात के समय ऐतिहासिक कारण तेन्दू के पेड़ों/लकड़ियों के रूप में पायी जाती है। यथाप्रकार इन कीटों में नीले/संतों की पत्तियों को खाते हैं। (चित्र 1)।

किसी समस्त: बदलते वातावरणीय परिपेक्ष में इस वर्ष तेन्दू पर इनका प्रक्रोप बढ़तायत में दिखाई पड़ रहा है। भविष्य में इन कीटों के नियंत्रण हेतु निम्नलिखित उपचार किया जा सकता है:-

1. माह अप्रैल-मई तक रात में प्रकाश प्रयंच (लाइट ट्रेंच) द्वारा भूगम्प (बीटल) को पकड़कर कैरोडेशन एवं बुधान नामक दबा के घोल में इंजेक्ट नट ड्राइ देना चाहिए।
2. यदि समस्या हो तो कीटनाशक दमिडाक्लोपिड (17.8 प्रतिशत एस. एल.) नामक दवा 0.003 प्रतिशत (1.70 मिली 10 दवा लीटर पानी में) अथवा मोनोकोटाफास नामक दवा 36 इंसी 0.05 प्रतिशत (14 मिली दवा 10 लीटर पानी में) घोल बनाकर अप्रैल माह के दूसरे साल से 15 दिन के अंतराल पर दो बार छिपकाव करना चाहिए।

चित्र 1: तेन्दू पत्तों में निस्प्रक-स्क्रेराबिट बीटल का प्रकार
नशीले पदार्थ एवं उनके दुष्प्रभाव

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जबलपुर

परिचय
आज के परिवेश में यह देखा जा रहा है कि बुजुर्ग व युवा वर्ग अपने आपको नशीले पदार्थों के सेवन करने में मुख का अनुभव करता है। परस्तु इन नशीले पदार्थों के दुष्प्रभाव उनके जीवन में परेर्यावरणों पैदा करती हैं एवं इसके आदि असाध्य बीमारियों से पीडित हो जाते हैं। प्रस्तुत लेख में उनसे होने वाली हानि की जानकारी हेतु कुछ नशीले पदार्थों के बारे में वर्णन करके उनके दुष्प्रभावों को उल्लेखित किया गया है।

हेरोइन (स्याक)
यह अफीम का सबसे फाइन रूप माना जाता है। यह सफेद पाउडर के रूप में होती है। इसे कागज के पाइप से नाक के जरिये खिंचा जाता है या इसे इंजेक्शन से लिया जाता है। इस स्याक के बहुत है।

ब्राउन शुगर
हेरोइन के कुछ कम शुद्ध रूप को ही ब्राउन शुगर कहा जाता है। यह भूरे रंग की होती है। यह हेरोइन की तीसरी ग्रेड की होती है। कम शुद्ध होने की वजह से यह हेरोइन की तुलना में सस्ती होती है। इसे हेरोइन की तरह उपयोग किया जाता है।

माफिन
यह अफीम के रस में पाई जाती है। यह तेजी से असर करने वाली दर्द निवरक द्रव्य है। इसमे नींद अत्यधिक आती है परस्तु इसका उपयोग नशीले पदार्थ के तीर पर अधिक होता है। इसे टेबलेट या इंजेक्शन के रूप में लिया जाता है।

गांजा
यह अफीम से बनने वाली द्रुग

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गांजा का वैज्ञानिक नाम केनाबिस सटाइवा है। फिमेल (मादा) गांजा के पौधे के सुखे फूल का ऊपरी भाग, तने एवं बीज का मिश्रण गांजा कोकीन सफेद पाउडर होता है जिसे कोका के पौधे की पत्तियों से तैयार किया जाता है। यह संहत के लिए अत्यन्त हानिकारक है।

एक्स्ट्रैक्ट
इसे एम.डी.एम. भी कहते हैं। इसे शराब के साथ लेना घातक होता है।

केटामाइन
इस दुनिया में सबसे हानिकारक नशीले पदार्थ की सूची में यह दूसरे नंबर पर है। केटामाइन के अन्यधिक सेवन से मतिभ्रम हो जाता है।

क्रिस्टलमेख
यह मीठा दिमाग पर असर करता है। नशा श्रृंग उतरने की बजह से लोग इसका इस्तेमाल ज्यादा करते हैं। यह भी मतिभ्रम का घातक है। इसे संक्रियता कम होती जाती है।

एल. एस. डी.
यह एक अश्किशाली साइकेडिलिक ड्रग है। यह मतिभ्रम का घातक है। एक एल.एस.डी. का असर लगभग बारह घंटे तक रहता है।

स्पीडबाल
यह हेरोइन और कोकीन का घातक मेल है। इसे हेरोइन के आदी ज्यादा आनंद प्राप्त करने के लिये लेते हैं।

नशीले पदार्थों के दुष्प्रभाव
अल्पकालिक
- बेचैनी
- घबराहट
- अवसाद
- धीमी

कुछ और भी नशा का नाम है।
• नींद आते रहना
• धड़कन बढ़ना

दीर्घकालिक
• रोगप्रतिरोधक क्षमता कम हो जाना
• शारीरिक मानसिक विकास रुकना
• कोशिकाओं के आकार में परिवर्तन
• सेक्स हार्मोनों में परिवर्तन
रोशनी करने के काम आता है।

मकाना बनाने आर रखने, दराजदार आलमारी पर लगायी जाती है। पिसी हुई छाल आर छाल का काटा गठिया से पीड़ित स्थान पर लगाते हैं। प्रस्तुत लेख में चिरहल के असामान्य बीजांकुरों का वर्णन किया गया है जो प्रयोगशाला में अंकुरण संबंधी अध्ययनों के दरार देखे गए हैं।

प्रयोगशाला
बीजांकुर (ढायाचित्र) भी देखे गये जिसका विवरण इस प्रकार है:
1. समारा
इसप्रकार के फलों में फलावरण पतला होकर पंख सदृश रचना बनाता है जो बीज के विकरण में सहायक होती है। समार के मध्य में एक बीज होता है।
2. फलावरण सहित बीज
यह दूधिया रंग का तथा दो बीजपत्र बाला होता है।
3. अंकुरित बीज
बीज कवर को फाइडर प्रांकूर मूलांकुर बाहर निकल आये हैं।
4. असामान्य नवोदभिष
बीज कवर को फाइडर मूलांकुर बाहर निकलता है परन्तु प्रांकूर अनुपस्थित है।
5. असामान्य नवोदभिष
दोनों बीजलाय एक दूसरे से अलग हो गये हैं परन्तु मूलांकुर में एवं प्रांकूर अनुपस्थित हैं।
6. असामान्य नवोदभिष
दो मूलांकुर निकले हैं एवं प्रांकूर अनुपस्थित हैं।
\begin{itemize}
\item सर्वश्रेष्ठ विरिया तथा लीनडरटज (1928) एवं सावलिन (1929) के प्रयोग परिणामों ने बीज विशेषज्ञों का ध्यान कृतिम माध्यम पर अंकुरण सम्बन्धों अध्ययनों के दौरान बीजांकुरों के आकारीय विकास की तरफ आकर्षित किया जिसमें सामान्य एवं असामान्य बीजांकुरों की पहचान हो सके क्योंकि सामान्य बीजांकुर ही बृद्धि प्रभाव वृद्ध होता है। वहुभूणाया या नुमनज विद्युत के फलस्वरूप बने असामान्य बीजांकुर आगे बृद्धि करने में असमर्थ होते हैं।
\item जमालुद्दीन एवं पुरोहित (1990) द्वारा विभिन्न वन प्रजातियों में असामान्य नवोदभिष देखे गये हैं।
\end{itemize}
Adathoda vasica in multiple curative disorders

Dr. P. Shivakumar Singh¹ and Dr. D.S.R. Rajender Singh²

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²Sri Venkateshwara Government Degree & Post Graduate College, Palem, Mahabubnagar, Telangana

Abstract
The available report is rigorous on the rural insight of fundamental curative medicinal plant Adathoda vasica Nees curing in various diseases by idyllic people of study area from Nagarkarnool dist. of Telangana, India. A total of three plant parts like root, leaf, flower using in the treatment ten disorders like fever, expectorant, inflammatory, plies, asthma, skin diseases, cough, cold etc., In the present results the importance of the rural curative plant insight have been observed. Apart from efforts are insolvent to educate the supplementary generations about their magnitude, it may be misplaced in future. This diversity of information might donate accurately in contemporary drug devious or in government policies to encroachment contemporary novel drug invent systems in rural origin areas, and in the enrichment of advance formulations with reference to rural curative medicinal important pant.

Introduction
Plants have played a critical role in maintaining human health and civilizing the quality of human life for thousands of years. The use of plants as Medicines is as old as human civilization itself and out of about 258,650 species of higher plants reported from the world; more than 10% are used to cure ailing communities (Shrivastava N 2006). The WHO has predictable that as many as 80% of the world people is dependent on rural medicine for their primary health needs. People living in the developing countries rely quite effectively on rural medicine for primary health care (Bannerman, 1982; Sullivan & Shealy, 1997; Singh, 2002). The art of herbal treatment has very deep root in Indian culture used the plants not only for curing diseases but also during several ceremonies. Today, there is an increasing desire to unravel the role of ethno-botanical studies in trapping the centuries old rural folk knowledge as well as in searching new plants resources of food, drugs etc (Jain, 1987). India is a repository of medicinal plants. At present about 65% of Indians are dependent on the rural system of medicine (Bhatt, 2002).

Adhatoda vasica, also known as malabar nut tree is part of the Acanthaceae plant family. It is a small evergreen, sub-herbaceous bush which grows commonly in open plains, especially in the lower Himalayas (up to 1300 meters above sea level), India, Sri Lanka, Burma and Malaysia (Shahriar, 2013). The Vasaka plant perennial, evergreen and highly branched with unpleasant smell and bitter taste, the plant lives for multiple seasons and retains its leaves throughout the year. It is a shrub 1.0 m to 2.5 m in height, with opposite ascending branches (Arabind KVK 2013). It is a highly reputed plant used in Ayurvedic system of medicine for the treatment of various ailments of respiratory systems like bronchitis, asthma and it is also used in the treatment of malaria, dysentery and diarrhea (Jain, 1984) and has many other medicinal applications (2-4), it shows potent anti-
inflammatory activity (Chakraborty, 2008) and *Adhatoda vasica* was traditionally used by midwives at the time of delivery because of its uterotonic activity. Due to its anti-implantation activity, *adhatoda* should not be used while pregnant (Gupta AP 1978).

Figure 1. Specific Study area
Nagarkarnool District, Telangana State, India.

**Methodology**
A number of scenery trips were undertaken in southern villages of head-quarter Of Nagarkarnool district Palem (Fig. 1). At each one time of trip, diverse ethnic and forest or rural people’s information was collected in diverse seasons. The information was accrued after discussions with several users like village head, elder women and other local informants. Repeated interviews through questionnaires were made in diverse villages to substantiate the information. Plant specimen were collected and identified with regional floras (Gamble, 1928, Pullaiah and Chennaiah, 1997; Pullaiah and Moulali, 1997, Pullaiah, 2015).

Nagarkurnool district will be carved out from the existing Mahaboobnagar district of Telangana state. The Nagarkarnool district will have an area of 7447 sq. kms and population of 10, 48, 425. The new mandals in the Nagarkurnool district will be Vanguru, Achampet, Amrabad, Balmur, Lingala, Uppunutala, Amangal, Kalwakurthi, Madgula, Talakondapalli, Veldanda, Koderu, Kollapur, Pedda Kothenpalli, Veepangandla, Bijinepalli, Nagarkurnool, Taduru, Telakapalli and Timmajipet.

The people of this district are frugally backward. The plant assortment is very rich and excellent growths of Adathoda vasica plant in wild have been observed. But there was no detail documentation on the selected plant from the specific study area.

So that the present work had been undertaken, in this report a number of the important rural medicinal plants, which commonly used in healing in numerous diseases had observed.

**Results**
The obtainable report is rigorous on the rural insight of fundamental curative medicinal plant *Adathoda vasica* Nees (Figure 2) curing in various diseases by idyllic people of study area from Nagarkarnool dist. of Telangana, India. A total of three plant parts like root, leaf, flower using in the treatment ten disorders...
like fever, expectorant, inflammatory, plies, asthma, skin diseases, cough, cold etc., (Table 1) In the present results the importance of the rural curative plant insight have been observed. Apart from efforts are insolvent to educate the supplementary generations about their magnitude, it may be misplaced in future. This diversity of information might donate accurately in contemporary drug devious or in government policies to encroachment contemporary novel drug invent systems in rural origin areas, and in the enrichment of advance formulations with reference to rural curative medicinal important pant.

**Table 1: The prominence plant parts like root, leaf, flower of *Adathoda vasica* in multiple curative disorders**

<table>
<thead>
<tr>
<th>Parts used</th>
<th>Preparation /dosage</th>
<th>Ailment</th>
<th>Source/Respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root</td>
<td>Roots and leaves are grounded. Extract was orally taken (DNS).</td>
<td>Fever</td>
<td>R-1</td>
</tr>
<tr>
<td>Leaf</td>
<td>Ginger + Leaf extract + Honey - 2 tsp taken orally. It dilutes sputum.</td>
<td>Expectorant</td>
<td>R-1</td>
</tr>
<tr>
<td></td>
<td>Leaf paste applied externally on joints over inflammated parts.</td>
<td>Anti-inflammatory</td>
<td>R-6</td>
</tr>
<tr>
<td></td>
<td>Leaf extract was applied over spiny outgrowths which controls bleeding</td>
<td>Piles</td>
<td>R-1</td>
</tr>
<tr>
<td></td>
<td>10 Leaves extract + honey (1 tsp) taken for 15 days for relieving cough and breathlessness. (Note: to prepare leaf extract, leaves are warmed and squeezed)</td>
<td>Asthma</td>
<td>R-1</td>
</tr>
<tr>
<td></td>
<td>Young leaves pounded with turmeric powder. This paste was applied over infected parts.</td>
<td>Skin diseases</td>
<td>R-14</td>
</tr>
<tr>
<td>White <em>Datura</em> flowers shade dried and smoked along with <em>Adathoda</em> leaf.</td>
<td>Asthma</td>
<td>R-12</td>
<td></td>
</tr>
<tr>
<td>White <em>Datura</em> flowers shade dried and smoked along with <em>Adathoda</em> leaf.</td>
<td>Asthma</td>
<td>R-12</td>
<td></td>
</tr>
<tr>
<td>Mature leaves (yellowish) 15- 20 boiled in 250ml of water. Reduce to half. The filtrate orally given to expel sputum</td>
<td>Cough and fever</td>
<td>R-40</td>
<td></td>
</tr>
<tr>
<td>Flower</td>
<td>Flower extract or churna (1/2 gm) + honey–taken orally three times daily. Relieves cough in children.</td>
<td>Cough</td>
<td>R-1</td>
</tr>
</tbody>
</table>

**Conclusion**

In the quick the people are rising abundantly, at the same time people are overlooking their original curative medicinal plants evidence. The work outcome will be possessions on future health care. Consecutively, work into initiations are needed to undertake
extensive education about their importance as a medicinally important and as a direct and indirect source of protection in health care system for the upcoming compeers. A very few of the autochthonous curative medicinal plants like *Adathoda vasica* are available in the treating of multiple disorders. So, exertions must be engaged to precaution aboriginal curative medicinal plants and also the scenery intelligence for vision health care arrangements.

**Acknowledgement**

Authors are thankful to rural, folkloric, ethnic peoples of surrounding villages of Palem surroundings of Nagarkarnool dist. head quarter of Telangana state for donation their clandestine information.

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Manjari green: Shaving brush of wild flowers

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²National Institute of Technology, Agartala

Shaving brush is most common essential tool for Men. This little tool is mainly made up of hair of a wild animal named Badger and plastic/wooden handle. Use of the hair of Manjari green Badger by hunting them made this species protected species in North America, but the same is prevailed in other parts of the world. The use of synthetic fibre and plastic in shaving brush give more than 500 MT plastic footprints in one time purchase. This large amount of plastic

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Agartala has designed and developed a shaving brush made of flowers of broom grass (locally known as Arjun Flower - panicles of Thysanolaena maxima) and bamboo. This eco-friendly shaving brush will be the milestone of future shaving brush industry.

This eco-friendly shaving brush will be produced by Panchai Farmers Club and marketed by Craft Bazaar promoter group, a start-up founded by Shubhajit Choudhury, Bentam Debbarma, Satyapriya Das, and Subrata Das of NIT Agartala. This eco-friendly product may receive a potential demand of more than 50,000 pieces per day to supply to the high end hotels and tourist resorts in the country. Besides this, it also has adequate potential to attract the customers while visiting saloon, hair parlour, spa etc. who certainly would like to use a fresh brush with an aroma of patchouli oil popularly known in aroma-therapy. The manufacturing cost per piece is just Rs. 5/- which can be sold for Rs 15/- in whole sale. The competitive ratio of cost of this eco-friendly shaving

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Broom Grass (Arjun Flower)

Broom Grass (Arjun Flower)
brush with other shaving brush product is at least 1:3. The life cycle of Manjari Green is at least 8 months from the day of first use and also due to a low-cost product it can be used as ‘use-and-through’ like materials in grooming parlours and even in high end hotels. Use of this product not only decreases hunting of Badger and use of plastic but also generate the livelihood of the target communities in the NE Region of the country. The product Manjari Green will be continuously upgraded as per the feedback of customer ensuring better customer satisfaction. With the similar concepts, other products like paint brush, wall paint brush etc. are also being developed by the various groups of innovative youth associated with CFLE.
Diversity of macro-fungi in central India-II: *Clarkeinda trachodes*

**Dr. R.K. Verma, Dr. C. K. Tiwari, Dr. Jagrati Parihar and Dr. Shailendra Kumar**

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**Introduction**

Mushrooms are seasonal fungi, which occupy diverse niches in nature in the forest ecosystem. They predominantly occur during the rainy season and also during spring when the snow melts. Mushrooms are in fact the ‘fruit bodies’ of the underground fungal mycelium. They are macrofungi forming macroscopic fruiting bodies such as agarics, boletes, jelly fungi, coral fungi, stinkhorns, bracket fungi, puffballs and bird’s nest fungi. *Clarkeinda trachodes* is a poisonous mushroom in the family Agaricaceae. It is distinguished by a large size basidiome, prominent chocolate or coffee brown to deep brown pellicle on the pileus disc surface. This agaric species is only distributed in South Asia in countries such as Bangladesh, China, India, Indonesia, Malaysia, and Sri Lanka (Hosen, 2011, Leelavathy et al., 1981, Yang, 1991). It has both a partial and universal veil, and dark-coloured spores (Leelavathy et al.1981). The official description of the species (as *Agaricus trachodes*) was first given by Miles Joseph Berkeley, from collections made in Sri Lanka (Berkeley, 1847).

This constitutes the first report of *Clarkeinda trachodes* from central India and its occurrence is rare.

**Materials and Methods**

Collection of samples

The fungal fruiting body was collected on 18 September, 2012 from tropical forest Research Institute campus Jabalpur, Madhya Pradesh. It is situated between (23°5' 37" to 23°6' 37"N latitude and 79°59'49" to 79 ° 59'42" E longitudes). The institute was established to provide research based assistance to the Forest Department. It is developing at a very rapid pace to make itself competent in the field of intensive research on tropical forests in Central India. All the relevant information regarding collected fungal fruiting bodies the habit and habitat, color, texture, size and size, hymenial configuration zonations etc. were recorded at collection spot. Spore prints were also taken. Specimen was also preserved in FAA (Formalin Acetic Alcohol). Microscopic examinations were made in laboratory. Microscopic details of various parts of fruitbody, hyphal system and spores were studied as suggested by Teixeira (1962). Specimen was deposited in the mycology herbarium of Forest Pathology Division, TFRI, Jabalpur, (M.P.) India.

**Results**

*Clarkeinda trachodes* (Berk.) Singer

(Figures 1-4)

**Scientific classification:**

- **Kingdom:** Fungi
- **Phylum:** Basidiomycotina
- **Class:** Agaricomycetes
- **Order:** Agaricales
- **Family:** Agaricaceae
Genus:  *Clarkeinda*
Species epithet:  *trachodes*

**Synonymy**

*Agaricus trachodes* Berk. (1847)

*Fungus trachodes* (Berk.) Kuntze (1898)

*Chitoniella trachodes* (Berk.) Petch (1909)

**Taxonomic description**

Basidiome terrestrial, large size, solitary. Pileus 7.5 cm in diameter, hemispherical expanding to convex, surface pale brown to grayish brown with a central region forming a large non expanding cartilaginous vinouceous brown pellicle, often with a recovered margin, reminder of surface radially rimose disrupting to form narrow, revolute grayish brown to vinouceous brown sqamules together with numerous small loosely floccose-verrucose; margin appendiculate, lamellae free, remote from stipe, at first white becoming dull yellow to grayish yellow, fuscescent, narrow, 13.0 x 3.0 cm, cylindrical, solid then fusulose, surface concolourous with pileus. Contex up to 1 cm thick, white, rapidly discolouring. Spore print pale yellowish green, spores ovoid to ellipsoid, yellowish green, thick-walled, truncate by an apical germ-pore, 6.0-7.0 x 3.5-4.5 µm, basidia clavate, bearing four short sterigmata, 34.5-39.0 x 9.5-10.0 µm, cheilocystidia scattered to crowded, pyriform, clavate, thin walled with a long pedicel, 23.0-25.5 x 4.5-5.5 µm.

**Host and collection examined:** Growing on soil in solitary as well as in troops amongst big grasses in TFRI, campus, Jabalpur collected by R.K. Verma and C.K. Tiwari, 18.09.2012. The preserved specimen was deposited in Mycology Herbarium, accession number TF-2797.

**Distribution:** Kerala, Madhya Pradesh

**Economic importance**

This species occurs solitary or in small groups on soil, and is poisonous.

**Discussion**

*Clarkeinda trachodes*, is a rare tropical Asian monotypic agaric (Leelavathy *et al*. 1981; Singer 1986; Pegler 1986; Yang, 1991; Carmine and Contu 2002) belonging to the family Agaricaceae. It is a large lepiotoid agaric, characterized by the presence of volva and annulus. The spore print is olive brown and the spores are small with truncated germ pore. This species has been reported earlier from only six places around the globe—Sri Lanka (Pegler 1986), India (Leelavathy *et al*. 1981), Malaysia (Pegler 1986), Indonesia, China (Yang, 1991) and Italy (Carmine and Contu 2002). Macrofungi play an important role in decaying wood, a natural resource of great value to man. Their primary importance, however, is in the continuous functioning of the carbon cycle. The amount of carbon returned to the atmosphere each year as a result of the microbial degradation of cellulose has been estimated in the magnitude of 85 billion tonnes per year (Cowling, 1963). Fungi play an essential role in maintaining tropical forest ecosystem. This forms the first report of this species from central India and its occurrence is rare.

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Van Sangyan (ISSN 2395 - 468X) Vol. 3, No. 12, Issue: December, 2016


Figures 1-2: Clarkeinda trachodes. (1) Habit (2) complete fruit body showing details of pileus and hymenial surfaces
Figures 3: *Clarkeinda trachodes*. Basidia, and cystidia

Figure 4: *Clarkeinda trachodes*. Basidiospores
हानिकारक कीटों द्वारा तुकसान

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सारांश
प्रस्तुत लेख भारत के पायों जाने वाले वनों में आभासित है। हानिकारक कीटों तथा वानिकी में घटने वाले आरोग्य को प्रदर्शित करता है।

परिचय
भारत के संपूर्ण भू-भाग में से लगभग 67.701 मिलियन हैंटर धूम्र पौधे होते हैं जो कि देश के संपूर्ण क्षेत्र का 22.8 प्रतिशत है। देश के विभिन्न भू-भाग राज्यों के संख्य निर्देशन होते जा रहे हैं। वनों का क्षेत्र एक गंभीर समस्या बनती जा रही है।

हमारे यहाँ के वनों में बहुत से प्रकार की वृद्धि प्रजातियाँ पायी जाती हैं। जिनमें सुखव रूप से यूक्लियास, विभिन्न प्रजातियाँ E. globules, E. grandis, E. tereticornis, सागौन अंकशिया की जातियाँ A. nilotica, A. catechu, A. auriculiformis एल्बिज़िया, नीम, केजुरीना इक्सिसितीफोलिया, सम्पूर्ण शीशम, बंबर, कुल्लू, खेजा, साल, हरूं, बहेरा तथा अन्य कोनीफोरस जैसे पाइनस आदि शामिल हैं जो कि आरोग्य दृष्टि से बहुत ही महत्वपूर्ण है।

किन्तु हमारे यहाँ के वनों में पौधों की विविधता तथा प्रजातियों का प्रक्रियात्मक आधार भी बहुत होता है। कीट रोगीय वन वृक्षारोपण क्षेत्र तक इन्हें प्रभावित करते हैं। रोगीय के छोटे पौधों को बाकी तुकसान पहुंचाते हैं। एक रिपोर्ट के अनुसार 1,000000 हैंटर क्षेत्र के बन इन कीटों द्वारा क्षतिप्रभाव हुए हैं।

कीटों के बारे में जानकारी
रोगीय, वृक्षारोपण तथा प्रकृतिकृत वनों के कीट सागौन (टीक T. grandis) Family – varbanaceae के कीट

होलोट्रिकिया प्रजाति - Coleoptera – Scarabaeidae
सामान्य नाम - व्हाइट ग्राव
होलोट्रिकिया कीटों की ऐसी प्रजाति है जो पौधों को बहुत ही तुकसान पहुंचाती है। इस कीट की इंट्री धूम्र सफेद रंग की मोटी सी C आकार की होती है। इसके सफेद रंग के कारण इसे व्हाइट ग्राव कहते हैं। यह मिट्टी के अंदर रहती है तथा छोटे पौधों की जड़ों तथा तनों को काटकर खा जाती है, जिसमें पौधा सूख कर जाते हैं।
हाँ होती है। विकास
यह सागौन (Lepidoptera – Hyblaeidae)
निष्प्रकार –
इस कीट की इल्ली, सागौन Avicennia sp, Callicarpa sp., Rhizophora sp. आदि की पत्तियों को खाती हैं किन्तु यह मुख्य रूप से सागौन की पत्ती को आहार बनाती हैं। बरसात के मौसम के शुरुआत में जब नवी पत्तियाँ आती हैं उस समय इसकी इल्ली इन पत्तियों को खाना शुरू कर देती हैं तथा पत्तियों को समृष्टि खाकर वुधों को पत्रविहीन कर देती हैं। सागौन के सभी वृक्षारोपण क्षेत्रों में इसका प्रक्रोप बढ़तायत मात्रा में पाया जाता है। जिसमें इसकी वृद्धि में बढ़त हुई प्रतिकूल प्रभाव (बड़ोतरी में 44 प्रतिशत से 50 प्रतिशत तक कमी) पड़ता है।

यूटेक्टोना मेकेरेलिस - Eutectona machaeralis (Lepidoptera: Pyralidae)
पत्र कंकालक –
यह कीट भी सागौन का मुख्य हानिकारक कीट है पीठों की वृद्धि के समय इसकी इल्ली पत्तियों के हरे भाग को पुरा खा जाती है तथा पत्ती सिर्फ कंकाल के रूप में बची रहती है। इसमें भी पेड़ पत्रविहीन हो जाते हैं। जिसमें इसके वृद्धि तथा विकास में रुकावट आती है और बढ़त हुई आर्थिक हानि होती है।

साल - Shorea robusta (Dipterocarpaceae)

हॉपोलोसिरामिब्स्क्स त्यासिनिकारिन (साल बोर) – Hopoloceramblys spinicornis (Sal borer) (Coleoptera: Cerambycidae)
भारत में यह कीट साल वृक्ष को बहुत अधिक मात्रा में हानि पहुँचाता है। आमतौर पर साल बोर के नाम से जाना जाता है। जो कि साल वृक्ष के लिये धातक कीट है तथा साल बन के लिये विनाशकारी है। यह साल के वृक्ष के अन्दर की कांड के अन्दर जाकर अपना जीवनचक पूरा करता है। लार्वा कांड को खाता हुआ सुरंग बनाता जाता है तथा लार्वा न भयावायक (अयस्क अवस्था) में अन्दर ही रहता है। यह साल के बड़े वृक्ष या भागारण की हुई लकड़ी सभी को नुकसान पहुँचाता है।

इससे प्रभावित वृक्षों में प्रभाव के लक्षण स्पष्ट नजर आने लगते हैं। शरद वर्ष केंद्र में भी पत्तियों नीचे की ओर से उपर तरफ मुख्य नगर लगती हैं तथा छाल से रेजिन तथा बुरादा निकलने लगता है बरसात के मौसम में व्यसक कीट बाहर आ जाते हैं जिन्हें बाहर देखा जा सकता है तथा इसके भारत में कई प्रक्रोप हो चुके हैं जिससे लाखों साल वृक्षों की हानि हुई है।

खेमेर – मेलाइफ्रो मारियियाराफ्स. (लेमियाती)
केलापीप्पा लियाना लेदीली (कोलियोम्पेरा - काइसोम्लीली)
सामान्य नाम – खेमेर निष्प्रकार
पोषक – खेमेर
केलापीप्पा लियाना खेमेर के वृक्षारोपण तथा प्राकृतिक रूप से उगे हुए पीठों व वृक्षों में जाया।
जाने बाला महत्वपूर्ण कीट है। एशिया में इसे विस्तृत रूप से रिकार्ड किया गया है। इसकी तरीकी ट्रांस्फरेशन में विचरण तत्त्वों को खाती है तथा न्यूक्लियर गणित को छोड़कर पूरी तरह भोजन करता है। इसका ब्लूफायर बीटल पशुधुन कीट वाल भूमि नाशक कीट है।

लेंटोसाइबी इनजेक्सा (होमोनेटेट्रा - ब्लूलीफिकी)
सामान्य नाम - व्यूगम चाउलसिड
पोषक - यूक्लिलिन्स्ट्रस प्रजाति
यह व्यूगम चाउलसिड गाल बनाने वाला कीट आस्ट्रेलिया से आया है। यह यूक्लिलिन्स्ट्रस के पौधों में गाल बनाता है, तथा विवृक्ष विभिन्न भागों की लाल, गोरों, न्यूडियैवं, तनजालिया तथा यूजार्ड आदि में पाया जाता है। विश्व भर में यह भारत में यूक्लिलिन्स्ट्रस केमेट्रोलिजिस्ट्स तथा केरोलिनास के प्लान्टेशन तथा नौकरी में पाया जा रहा है। इसके अलावा यह गाल कीट यूक्लिलिन्स्ट्रस की अन्य प्रजातियों जैसे यू. लुक्लेयोडिस्ट्रस, यू. विजेसियॉला, यू. डीगरी, यू. ग्लास्वुलस, यू. सेलिसिस्ट्रस, तथा यू. विमिनेलिस में भी गाल बनाता हुआ पाया गया है।

लेंटोसाइबी इनजेक्सा पौधों के तनों की छाल या पत्तियों की मुख्य शिराओं पर अण्डे बनाता है। जिनमें से फोर्ट रंग की अतिसुम्ब इल्लियो निकलती है। इसके ही भोजन की तुलना बाल भूमि नाशक कीट में यह भारत के नीलगिरी नाशन खाता है।

Wood Fibre Insect - Parthenoleucoptes
Common Name - Woodborers
Host - Parthenoleucoptes
This woodborer is a pest of coniferous plants. It is found in various parts of the world, including India. It lays eggs on the bark of coniferous plants, which hatches into larvae that feed on the bark and wood. The larvae can cause significant damage to coniferous trees. It is a pest of coniferous trees and can cause significant damage to trees in parts of the world where it is found.
Azima tetracantha Lam. - An ethanobotanical plant with biocidal properties from the forest of Andhra Pradesh

Institute of Forest Biodiversity
(Indian Council of Forestry Research & Education, Ministry of Environment, Forests and Climate Change, Govt. of India)
Dullapally, Hyderabad-500 100

General

Information
Botanical Name:
Azima tetracantha Lam.
Common Name:
Needle bush, Bee-sting bush
Synonym
Monetia barlerioides L'Her
Family
Salvadoraceae
Local name
Tella uppi
Parts Used
Leaves, Bark and complete plant
Chemical content
Alkaloids Flavonoids and Secondary metabolites
Flowering and Fruiting
November-April
Distribution
Nalagonda, Warangal, Srikakulam, Visakhapatnum, East Godavari and Nellore districts.

Tropical forests of Andhra Pradesh are rich in biodiversity. Native people use various plant products for different and specific purposes. Many workers recorded use of certain plant species by the native people for insect repellent, attractant, antifeedent and insecticidal activity. On the other hand world over intense efforts are on to identify newer compounds of insecticidal properties with novel modes of action. The plant world comprises of a rich array of biochemicals that could be tapped for use as insecticides. The toxic constituents present in plants represent the secondary metabolite groups. Their particular role in many of the plant species are not completely known to the science. However, it is assumed that they have only insignificant role in the primary physiological processes in plants that synthesize them. Some of the secondary metabolites are merely end products of
aberrant biosynthetic pathways and others excretory products. Knowledge of the toxic plants, and the toxic principles and their biological activity is important not only to utilize them as natural insect control agents and replace the toxic commercial chemical insecticides but also to understand the nature of their toxicity in non-targeted species. Over 2,000 plant species out of about 2,50,000 have been reported to possess insecticidal activity in which only a fraction of them are analyzed for biocidal properties and many more insecticidal plants awaits discovery.

**Description**
*Azima tetracantha* is a much-branched, spiny, evergreen shrub growing from 0.5 - 3 meters tall. Usually erect with arching branches, the plant sometimes adopts a more climbing habit. The spines are axillary, in pairs up to 4cm long. Leaves elliptic-ovate, 2.2-5 X 1- 3.3 cm, pale, glabrous, shining coriaceous, base acute, apex sharply mucronate; petiole 4mm long. Flowers small, zygomorphic, unisexual, greenish white, in axillary fascicles, bracts foliaceous, pubescent, spinose-pointed. Male flowers numerous, crowded in axillary fascicles. Female flowers solitary or geminate. Berry globose, white, edible. The plant is harvested from the wild mainly for local use as a medicine. It is sometimes cultivated for medicinal use and is grown as a hedge and an ornamental.

**Cultivation details**
The plant coppices readily and spreads through underground runners. *Azima tetracantha* varies considerably over the range of its distribution, yet it is an easily recognizable and distinct species. The male plants lack spines, or have poorly developed ones, while female specimens have long spines. A dioeciously species, both male and female forms need to be grown if fruit and seed are required.

**Edible uses**
Fruit – raw
The fruit is a globose green to white berry around 5 – 10 mm in diameter, containing 1 - 2 seeds. The oil obtained from the seed contains the fatty acids myristic acid 0.2%, palmitic acid 5%, stearic acid 15%, arachidic acid 7%, behenic acid 2%, oleic acid 32%, linoleic acid 18% and eicosenoic acid 21%, indicating that the oil could be suitable as an edible oil.

**Medicinal**
The sap of the plant is applied directly to treat toothache and bleeding gums after tooth extraction and also as a disinfectant. The roots are antidote and diuretic. They are used in the treatment of rheumatism, dropsy and stomach disorders. The pounded roots are applied directly to snakebites, whilst an infusion is also taken orally as a treatment for them. The root bark is used in the treatment of rheumatism. The bark is expectorant. The leaves are stimulant. They are eaten with food as a treatment for rheumatism. The leaf juice is used in the treatment of asthma and coughs caused by phthisis. The pickled leaves are used as an appetizer and against colds. An infusion of the leaves is used to treat general diseases. The crushed leaves are applied directly to painful teeth, whilst the leaf juice is applied to the ears to treat ear aches. The juice of the
berries is applied directly into the ear to treat ear ache.
The dimeric piperidine alkaloids azimine, azcarpine and carpaine have been isolated from all plant parts. All parts contain glucosinolates. These are hydrolyzed into thiocyanates and isothiocyanates, and the resulting compounds have anti-oxidant and sometimes anticarcinogenic activities. Terpenoids are present in the roots and the leaves.
The seeds contain a complex mixture of about 25 flavonoids, predominantly as glycosides and acyl-glycosides, the most important being quercetin, isorhamnetin, rhamnetin and rhamnazin.
Despite the plant’s traditional uses, the leaves have tested negative in antibacterial and antifungal tests. The anti-inflammatory activity of the powdered leaf has been confirmed in tests on oedema in rats. The wound-healing activity of a methanol extract was confirmed both as ointment and when injected.

Uses
In Andhra Pradesh the pounded roots of *Azima tetracantha* are applied directly to snakebites and an infusion is taken orally as a treatment for them, while in Zimbabwe a mixture of roots and leaves is used similarly. The people of the Vishakhapatnam use a root decoction to treat stomach disorders. In Nalagonda an infusion of the leaves is used to treat venereal diseases. In the East Godavari the juice of the berries is applied directly into the ear to treat ear ache and the dried root is ground, put in cold water and given to cows to facilitate difficult parturition. The Warangal people apply the sap of the plant directly to treat toothache and bleeding gums after tooth extraction and also as a disinfectant. In Andhra the root, root bark and leaves are added to food as a remedy for rheumatism. The plant is considered diuretic and is also used to treat dropsy, dyspepsia, chronic diarrhea and as a stimulant tonic. In western India juice of the leaves is applied as eardrops against earache and crushed leaves are placed on painful teeth.
The fruit is edible. *Azima tetracantha* is browsed by livestock. It is planted as live fence in Bangalore (India).

Agro forestry uses
The scandent, straggling growth habit of the plant, combined with its spines, makes it a useful species for hedges. The hedge tends to open up underneath but pruning will keep it in shape. The plant is grown as a living fence in India. The plant is a common, widespread pioneer and so could be used in re-forestation projects, especially within its native range. The South African Department of Agriculture considers his species to be an indicator of bush encroachment. Land users in certain areas are required to control the species to prevent deterioration and maintain the productivity of pastoral land. Overgrazing is the main reason for encroachment.

Habitat
Mangrove edges, sea-dunes, coastal bushland, not far from high-water mark; scrub on eroded ground, and particularly on saline or alkaline soils near lakes and seasonal rivers; rocky bushy maritime hilly places, at elevations up to 1,100 metres.

Growth and development
The scandent, straggling growth habit and its spines make *Azima tetracantha* a useful
species for hedges. The hedge tends to open up underneath but pruning will keep it in shape. It coppices readily and spreads through underground runners.

**Ecology**

*Azima tetracantha* is found in bush, scrub and forest, along rivers and at the coast, up to 1100 m altitude. In Vishakhapatnam it is common among banks of seasonal rivers where the soil is saline, notably in the edges of mangrove. In Nalagonda *Azima tetracantha* occurs on hillsides, in shrub savanna, often on termitaria.

**Propagation and planting**

A few specialist nurseries in the Andhra Pradesh offer seeds of *Azima tetracantha* for sale for ornamental purposes. Multiplication through cuttings is possible.

**Management**

Andhra Pradesh farmer considers *Azima tetracantha* an indicator of bush encroachment. Land users in certain areas are required to control the species to prevent deterioration and maintain the productivity of pastoral land. Overgrazing is the main reason for encroachment. When used as a hedge or barrier plant, it needs to be pruned regularly to keep a compact shape. A wide range of phytochemical constituents have been isolated from *A. tetracantha* Lam which possesses activities like as stimulant, expectorant, antispasmodic, analgesic, anti-inflammatory, anti-ulcer, anti-diarrhoeal, anti-microbial, nephroprotective, hypoglycemic, hyperlipidemic and insect repellant activities. Therefore it is pertinent to validate the ethnobotanical records with respect to insecticidal properties of forest flora of this region by screening them for bioefficacy against insect pests of crop plants.

**References**


वायु प्रदूषण नियंत्रित करने वाले कुछ पौधे

दृ. रेखा बग्नाल
शासकीय आदर्श विज्ञान महाविद्यालय
जबलपुर (M.P.)

वायु के भीतर, रासायनिक या जैविक गुणों में ऐसा कोई भी अवरोधित परिवर्तन जिसके द्वारा स्वयं मनुष्य के जीवन या अन्य जीवों, जीवन परिस्थितियों, हमारे जैविक संरचनाओं तथा हमारी सांस्कृतिक समपत्ति को हानि पहुंचे या हमारी प्राकृतिक संपन्नता नष्ट हो जाए तो उसे हानि पहुंचे, वायु प्रदूषण कहलाता है।

दरअसल वायु सभी मनुष्यों, जीवों और वनस्पतियों के लिए अत्यंत आवश्यक है। मनुष्य विना भोजन-पानी के कुछ दिनों तक जीवित रहना सकता है लेकिन हवा के बिना कुछ ही मिनट भी जीवित रहना उद्यमित है। वायु में 78% नाइट्रोजन, 21% ऑक्सीजन, 0.03% कार्बन-डाय-आक्साइड एवं शेष निष्क्रिय गैस और जल वाणी होती है।

वैज्ञानिकों के अनुसार के अनुसार पौधों के वायुमंडल में करीब 6 लाख अरब टन हवा है। एक सामान्य स्वस्थ्य य्वक्ति एक दिन में 22 हवाज्ञ बार स्थान लेता है। लेकिन आज वायुमंडल में वायु प्रदूषण बढ़ता जा रहा है। हवा में कई हानिकारक गैसों की संख्या बढ़ते ही जा रही है। एक अनुमान के अनुसार पिछले सात दशकों में 10 लाख टन कोआउट, 8 लाख टन निक्लियम तथा 6 लाख टन आर्मेनिक सहित अन्य गैसें वायुमंडल में समाविष्ट हो चुकी है। वैज्ञानिकों का कहना है कि यदि यही स्थिति बनी रहे तो अन्य वाणी समय में स्थिति बहावह हो जाएगी। आज वातावरण में प्रदूषण का स्तर इतना बढ़ गया है कि अब दंसारों का सांस लेना भी दुर्भर हो गया है। ऐसे में प्रदूषण की रोकने के लिए अधिक से अधिक पेड़-पौधे लगाने चाहिए।

शाब्द इसी कारण लोग अपने घरों के अंदर पेड़ लगाना रहे हैं। ऐसे में सबसे अच्छा विकल्प यह है कि पेड़-पौधों की ज्यादा से ज्यादा मात्रा में लगाया जाए। लेकिन समस्या यह है कि उसके लिए पर्याय समय ही तो चाहिए। शाब्द यही बजह है कि लोग अब अपने घरों के अंदर पौधे लगाये रहें हैं।

हालांकि पौधों के अंदर कौन-कौन से पौधे लगाये चाहिए, इसकी जानकारी हर किसी को नहीं होती। इसलिए प्रस्तुत लेख में ऐसे पौधों के बारे में वर्णन किया गया है जो हमें अपने घर के भीतर लगाने चाहिए। वर्ष 1989 में हुए नासा के 'कौन-कौन एयर स्टार्ट' में यह प्रमाणित हो गया है कि घर की हवा को शुद्ध करने के लिए घरेलू पौधे उत्तम होते हैं। घर के अंदर की हवा में काफी मात्रा में जंतुन वायु अतिरिक्त की जाती है।
(Benzene), (Trichloroethylene) एवं अमोनिया (Ammonia) जैसे कई तरह के हानिकारक रसायन पाए जाते हैं। लेकिन नासा के वैज्ञानिकों का दावा है कि घर के भीतर बढ़ते वायु-प्रदूषण के स्तर को कम करने में ये घरेलू पौधे बहुमूल्य हृदयांतर के रूप में काम करते हैं। कुछ पौधे ऐसे होते हैं कि इन्हीं घरों, सार्वजनिक स्थानों और कार्यालयों के अंदर की हानिकारक गैंस को 85% तक अभावीपित कर लेते हैं। ये पौधे सिफ़्फ़ हानिकारक गैंस को ही नियंत्रित नहीं करते, अतः हमारे घरों को सुंदर बनाने का काम भी करते हैं। अच्छे स्वास्थ्य और शुद्ध हवा के लिए हमें अपने घरों में इन पौधों को अवश्य लगाना चाहिए।

Anthurium andraeanum (राजहंस सिली)

राजहंस सिली हवा में नमी और वाण्य को बनाए रखती है। यह जाइलेन (Xylene) और टूलें (Toluene) जैसी हानिकारक गैंस को अभावीपित कर उन्हें हानि रहित पदार्थ में बदल देती है।

Gerbera jamesonii

यह उनमें फूलों बाह्य हवा में मौजूद विपाक पदार्थों को बत्त करने में मदद करता है। इसे अच्छी तरह से गर्म वातावरण में रखना होता है।

Scindapsus (‘Golden Lotos’)

गोल्डन लोटस हवा में बढ़ने और सभी पौधों में से स्वाद-तमम पौधा है। यह घर की हवा को स्वाद रखने के लिए उत्तम है। लेकिन एक बात है कि ये एक तरह से जहरीला पौधा भी होता है। इसलिए इसे ब्रजों और जानवरों से दूर रखना चाहिए।

Aglaonema

इस चीनी सदाबहार पौधे को बढ़े होने के लिए, ज्यादा प्रकाश की ज्ञरत नहीं होती। लेकिन इसे प्रचुर मात्रा में नमी वुक्त हवा की ज्ञरत होती है।
यह सावित हो गया है कि ये पीधा हुआ से वेंजीन जैसे पदार्थों को साफ कर हुआ को शुद्ध बनाता है।

**Chlorophyllum (spider plant)**

यह पीधा घर के अंदर उपयोग के लिए काफी अन्य्य था। इसका कारण सिर्फ सुंदर दिखना नहीं है, बल्कि अध्ययन से प्रमाणित हो गया है कि यह पीधा घर की हुआ से विभाजक गैसों जैसे- वेंजीन (Benzene), फॉर्मैल्डेहाइड (formaldehyde), कार्बन मोनो आक्साइड (Carbon Monoxide) और जाइलीन (Xylene) को भी समाप्त करता है।

**Ivy**

यह पीधा कम प्रकाश वाली जगह के लिए सबसे बेहतर है। यह भी घर में मौजूद हानिकारक गैसों को खत्म करने में मदद करता है।

**Azalea**

यह पीधा प्लांट, फॉर्मैल्डेहाइड और कार्बन मोनो आक्साइड से आने वाली गंध को खत्म करने में मदद करता है। अगर इसकी

उचित प्रकार से देखभाल की जाए, तो यह काफी लंबे समय तक जीवित रह सकता है।

**Sansevieria (Mother-in-Law’s Tongue)**

यह काफी कठोर और किसी भी परिस्थिति में जीवित रहने वाला पीधा है। इसकी खास बात ये है कि यह अन्य की तरह हानिकारक गैसों को तो खत्म करता ही है। साध ही यह रात में ऑक्सीजन गैस भी दूर करता है। इस पीधे को ज्यादा पानी की
जहूत नहीं पड़ती है। इसे स्थान में रखना चाहिए जहां ज्यादा सूरज का प्रकाश ना मिले।

**Draeana marginata**

यह धीरे-धीरे बढ़ते वाला पौधा है। यह पौधा भी हानिकारक गैस जाइलिन (Xylene), ट्रिच्लोरोएथीलीन (Trichlorethylene) और फॉर्मॉलिडाइड (formaldehyde) को खत्म कर देता है।

**Philodendron**

इस पौधे को काफी कम प्रकाश वाली जगह पर रखने पर भी इसके विकास पर कोई असर नहीं पड़ता। इसकी देखभाल भी आसान है। लेकिन यह वज़्दां और जानवरों के लिए खतरनाक हो सकता है।

**Nephrolepis (Bostan Fern)**

यह हवा में नमी कायम रखने और हानिकारक गैसों जैसे कार्बन डाइऑक्साइड को खत्म करने वाला बेहतर पौधा है। इसे नियमित पानी की आवश्यकता होती है और यह छाया में भी रह सकता है। उसे आड़ता और अप्रत्यक्ष रूप से प्रकाश लेने वाले इस पौधे को शांत और ढंगी जगह पर रखें। पौधे की मिट्टी को रोजना दें और अगर पानी की जरूरत है तभी पानी दें।

**Spathiphyllum (Peace Lily)**

पीस लिली घरों में लगाया जाने वाला एक आम पौधा है, जो हर तरह की हानिकारक गैसों को खत्म करता है। यह धूल को भी समाप्त करता है और घर की हवा को शुद्ध रखता है। शांत लिली का यह
बंस का पौधा हवा की शुद्ध करने में सबसे ज्यादा कारगर माना जाता है। यौगिक ती से यह पौधा काफी बड़े हो जाते हैं लेकिन इसलिए के लिए छोटे पौधे भी आसानी से मिल जाएंगे। यह गजावट के लिए भी इतने काम किये जाते हैं। यह पौधा भी हानिकारक गैसों को शुद्ध करने का काम करता है। इसके फर्नीचर के बाग में रखने पर यह उसमें प्रकृत रसायन को बाध्य में परिवर्तित कर खत्म कर देता है।

*Schefflera*

यह पौधा भी घर की हानिकारक गैसों को खत्म करता है। इस पौधे को कुछ देशों में ‘अंब्रेना ट्री’ भी कहा जाता है।

यह सुंदर फूल सिर्फ़ घरों की सजावट करने का काम ही नहीं करता, बल्कि विशाल गैसों को खत्म करने का भी काम करता है।

हर कोई स्वस्थ रहना चाहता है। बुद्ध को स्वस्थ रखने के लिए पौष्ठिक भोजन और स्वयं की साफ-सफाई रखना बहत जरूरी है लेकिन सिर्फ़ अपनी ही नहीं, बल्कि आपके आस-पास का वातावरण भी साफ सुधर रहना चाहिए। सिर्फ़ स्वयं की साफ सफाई से ही आप स्वयं को सुरक्षित नहीं रख सकते। घर बड़ा हो या छोटा, नया हो या पुराना, वहां
पर ऐसे अस्थायी विषयक पदार्थ पाए जाते हैं जो हवा को निरन्तर प्रभावित करते हैं। इसी हवा में हम सांस लेते हैं तो स्पष्ट सी बात है कि यह कहीं ना कहीं हमारे शरीर पर बुरा असर डालती है। इसलिए जरूरी है कि घर के अंदर की वातु को शुद्ध किया जाए, और इसे सफा करने का सबसे अच्छा तरीका है कि घर में ऐसे पौधे लगाए जाएं जो हवा को शुद्ध करें। कुछ ऐसे ही घर में लगाये जाने वाले पौधों हैं जो हवा को ती सफा करते हैं। साथ ही घर की सजावट में भी उपयोग किए जा सकते हैं।

नेबेरा बेज़ी (Gerbera Daisy)

रंगीन चमकीले पूलों बाला यह पौधा सिर्फ सजावट के लक्ष्य का ही नहीं बल्कि कार्बन मोनोऑक्साइड और ब्रेसिन गैस को अवशोषित कर लेती है। ऐसे पौधों को श्रद्धांजलि प्राप्त के लिए आवश्यक माना जाता है।

ड्राकेना (Dracaena)

लंबे पत्तों बाला यह पौधा सफेद, क्रीम और लाल धारियों में होता है।
10 फुट की लंबाई के बीच ही रहता है। इस पौधे में हवा को साफ करने के काम होती है।

एलोवेरा (Aloe Vera)
इस पौधों को ज्यादा केसर की जरूरत नहीं होती। यह संग्रह के लिए बहुत ही बदिया माना जाता है। इसकी पत्तियों में विटामिन, एंजाइम, अमीनो एमिड, और अन्य योगिक पाए जाते हैं जिसमें एंटीबॉडी और एंटी-इंफेक्टियल गुण पाए जाते हैं।

वार्डन मम (Garden Mum)
यह पौधा अमौनिया, बेंजीन, फॉर्मल्डेहाइड और जाइलियन को हटाकर हवा को शुद्ध करते हैं। यह बाजार में आपको आसानी से मिल जाएगी। आप इसे पार के बाहर भी लगा सकते हैं।

वायु प्रदूषण के केवल मनुष्यों को ही नहीं बल्कि वनस्पतियों, जीव-जंतुओं, जलवायु, मौसम, ऐतिहासिक इमारतों और यहां तक की अंदों परत की भी नुकसान पहुँचाता है। वायु प्रदूषण के कारण मनुष्यों को दमा, गले का दर्द, निमोनिया, एप्फायसीया, ब्रॉंकाइटिस, चिंतर्द, उल्टी, फेफड़े का कैंसर, हड़प्पा रोग, जुकाम, खांसी और आंखों में जलन आदि जैसी समस्या पैदा हो जाती है।

इसी तरह वायु प्रदूषण के कारण सूर्य के प्रकाश की मात्रा में कमी आती है जिससे पौधों की प्रकाश संकेतण की क्रिया प्रभावित होती है। वायु प्रदूषण के कारण जीव-जंतुओं का भ्रमन तन्त्र और उबाल तंत्र का तन्त्र प्रभावित करता है। वायु प्रदूषण के कारण ही जलवायु भी प्रभावित हो रही है।

पीछे कुछ सालों में जिस तरह जलवायु परिवर्तन हुआ है उससे बाद और सूर्य की स्थिति पैदा हो गई है। यही नहीं मौसम पर भी वायु प्रदूषण का विपरीत प्रभाव पड़ा है। वायु प्रदूषण के कारण ही पृथ्वी की सूर्य से आने वाली परावर्ती किरणों के बचाने वाली अंदं अर्थ में अद्वितीय हो गया है। ऐतिहासिक इमारतें भी यह प्रभावित हो रही है।

वायु प्रदूषण के कारण ही पृथ्वी की उंचाई से अलग बन गई है। कुछ इमारतें भी यह प्रभावित हो रही है। मनुष्यों के साथ-साथ इन जलवायुगत गतिविधियों का प्रभाव वनस्पतियों पर भी पड़ता है। पौधों की पत्तियों में पाए जाने वाले स्टोनेट को धुरूक्कर अवरुद्ध कर देते हैं जिसके कारण पौधों की जीवन संवधाय प्रक्रिया रूप से जाती है और धारे अविरल हो जाते हैं। इसके अलावा वायु प्रदूषण का प्रभाव ऐतिहासिक इमारतों पर भी पड़ता है। मपुरा रिफाइनरी की एसिड लॉपर्ट के कारण आपरा के ताजमहल तथा मपुरा के मंदिरों पर इसका
ताजमहल का संगमरमर पीला पड़ता जा रहा है, जिसे 'संगमरमर का कैसर' कहा है। इसके अतिरिक्त इंद्रधनुष विजली घर के कोरके की राख एवं दिल्ली रेलवे स्टेशन के इंजनों के धुंध ने लालकिले के पत्थरों पर भी विपरीत प्रभाव डाला है। वायु प्रदूषण पर नियंत्रण हेतु विधामान बन की सुरक्षा, बन बिनाश रोकने तथा वृक्षारोपण की आवश्यकता है। पौधे के राख ने नियंत्रण करने का सबसे बड़ा साधन है। कम से कम 33 फीसद भू-भाग में बन होना चाहिए, जबकि वर्तमान में यह 23 मात्र 23 फीसद क्षेत्र पर ही है। इससे वायु प्रदूषण नियंत्रण तथा पारिस्थितिक संतुलन बनना रहेगा।

प्रदूषक शहर एवं गांव के चारों ओर हरित पट्टी होनी चाहिए। इसी प्रकार आर्थिक क्षेत्र के चारों ओर हरित पट्टी होनी चाहिए। आयु प्रदूषण को मुक्त, मोटर वाहन बाहर होना। अतः इसके इंजन का निर्माण इस प्रकार ही किया जाना चाहिए कि उसके न्यूनतम प्रदूषण का उत्सर्जन हो।
Human identification and fingerprints

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Abstract
There are three main fingerprint patterns: arches, loops and whorls. I suggest a method of personal identification based on finger-vein patterns. Finger vein patterns have recently been recognized as an effective biometric identifier. A friction ridge is a raised portion of the epidermis on the digits, the palm of the hand or the sole of the foot, consisting of one or more connected ridge units of friction ridge skin. In the Henry system of classification, there are three basic fingerprint patterns describing here. Biometrics is the statistical measurement of human physiological or behavioral characters. Biometric techniques for personal identification have been attracting attention recently because conventional means such as keys, passwords and PIN numbers have problems in terms of theft, loss, and confidence on the user’s memory.

Keywords: Arches, Loops, Whorls, Fingerprint, Friction ridge

Introduction
Fingerprint fundamentals and basic patterns of identification
The use of fingerprints in forensic science is based on several fundamental principles. One is that, the probability of finding two people with identical fingerprints is very small. In fact, no two identical fingerprints have ever been found same. Galton calculated that probability of finding identical prints was 1 in 64 millions. A second principle is that an individual's fingerprints do not change with time. The pattern of ridges on a person's fingertips, palms and soles at birth remains unchanged until death. The basic patterns of fingerprints are loops, whorls and arches that can be found in fingerprints. About 60 to 65 percent of the populations have loop patterns, 30 to 35 percent have whorls, and only about 5 percent have arches. The ridges run from one side to the other of the pattern, making no backward turn. Ordinarily, there is no delta in an arch pattern but where there a delta, no re-curving ridge must intervene between the core and delta points. There are four types of arch patterns: plain arches, radial arches, ulnar arches and tented arches. Plain arches have an even flow of ridges from one side to the other of the pattern and the ridges enter on one side of the impression. The ridges of radial arches slope towards the thumb, have one delta and no re-curving ridges. On ulnar arches, the ridges slope towards the little finger, have one delta and no re-curving ridges. Tented arches have an angle, an up thrust, or two of the three basic characteristics of the loop. They don’t have the same “easy” flow that plain arches do and particularly have “significant up thrusts” in the ridges near the middle that arrange themselves on both sides of a spine or axis towards which the adjoining ridges converge and appear to form tents. Loops occur in about 60-70 % of fingerprint patterns encountered. One or more of the ridges enters on either side of the impression, re-curves, touches or crosses the line running from the delta to the core and terminates on or in the...
direction of the side where the ridge or ridges entered. Each loop pattern has is one delta and one core and has a ridge count. Radial loops are named after the radius, a bone in the forearm that joins the hand on the same side as the thumb. The flow of the pattern in radial loops runs in the direction of the radius (toward the thumb). Radial loops are not very common and most of the time radial loops will be found on the index fingers. Ulnar loops are named after the ulna, a bone in the forearm. The ulna is on the same side as the little finger and the flow of the pattern in an ulnar loop runs in the direction of the ulna (toward the little finger). Whorls are seen in about 25-35 % of fingerprint patterns encountered. In a whorl, some of the ridges make a turn through at least one circuit. Any fingerprint pattern which contains 2 or more deltas will be a whorl pattern. There are four types of whorl patterns. Plain whorls consist of one or more ridges which make or tend to make a complete circuit with two deltas, between which an imaginary line is drawn and at least one re-curving ridge within the inner pattern area is cut or touched. Central pocket loop whorls consist of at least one re-curving ridge or an obstruction at right angles to the line of flow, with two deltas, between which when an imaginary line is drawn, no re-curving ridge within the pattern area is cut or touched. Central pocket loop whorls make one complete circuit which may be spiral, oval, circular or any variant of a circle. Double loop whorls consist of two separate and distinct loop formations with two separate and distinct shoulders for each core, two deltas and one or more ridges which make, a complete circuit. Between the two at least one re-curving ridge within the inner pattern area is cut or touched when an imaginary line is drawn. Accidental whorls consist of two different types of patterns with the exception of the plain arch, have two or more deltas or a pattern which possess some of the requirements for two or more different types or a pattern which conforms to none of the definitions.

Survey of literatures


Arches

Arches create a wave-like pattern and include plain arches and tented arches. Tented arches rise to a sharper point than plain arches. Arches make up about five percent of all pattern types.

In arches, the ridges of the finger run continuous from one side of the finger to the other with no recurving. There are two sub-groups that further define the arch pattern:

1. Plain Arch: this pattern has a consistency of flow to it. It starts on one side of the finger, and then the ridge cascades upward slightly, almost resembling a wave out on the ocean. The plain arch then continues its journey along the finger to the other side. The plain arch is the simplest of the fingerprint patterns to discern.

2. Tented Arch: this pattern is similar to the plain arch in that it starts on one side of the finger and flows out in a similar pattern to the other side. However, the difference in the tented arch lies in the ridges in the center, which are not continuous as
in the case of the plain arch. The ridges, which adjoin each other in the center, converge and thrust upward, giving the impression of a pitched tent.

**Arch**

**Loops**: prints that recurve back on themselves to form a loop shape. Divided into radial loops (pointing toward the radius bone, or thumb) and ulnar loops (pointing toward the ulna bone, or pinky), loops account for approximately 60 percent of pattern types. In loops, the ridges make a backward turn but do not twist. This backward turn, or loop, is differentiated by how the loop flows on the hand and not how it flows on the card on which the imprint is taken. The imprint on the fingerprint card is similar to the reverse image we see when we look in the mirror at ourselves. There are two sub-groups that Henry identified in this category:

1. **Radial Loop**: these are loops that flow toward the radius bone of the hand or, in other words, when the downward slope of the loop is from the direction of the little finger toward the thumb of the hand.
2. **Ulnar Loop**: these are loops that flow toward the ulna bone of the hand or, in other words, when the downward slope of the loop is from the direction of the thumb toward the little finger of the hand.

**Loop**

**Whorls**: form circular or spiral patterns, like tiny whirlpools. There are four groups of whorls: plain (concentric circles), central pocket loop (a loop with a whorl at the end), double loop (two loops that create an S-like pattern) and accidental loop (irregular shaped). Whorls make up about 35 percent of pattern types. In whorls, there are patterns in which there are two or more deltas (first ridge nearest the divergence point of two type lines) and there exists a recurve preceding each delta. There are four sub-groups of whorls:

1. **Plain Whorl**: in these whorls, the ridges make a turn of one complete circuit and, therefore, are circular or spiral in shape. The plain whorl is the simplest form of whorl and the most common. There are at least two deltas and a ridge whose circuit may be spiral, oval or circular in shape.
2. **Central Pocket**: in these whorls, one or more of the simple recurves of the plain whorl recurves a second time.
1. Double Loop: in these whorls, there are two separate loop formations. In each of these formations, there are two entirely separate and distinct sets of shoulders and deltas.

2. Accidental Whorl: in these whorls, the composition of the pattern is derived from two distinct types of patterns with at least two deltas. Whorls which contain ridges matching the characteristics of a particular whorl sub-grouping are classified as accidental whorls.

**Conclusion**
The information was received to results around the world show a very high correlation with the 1953 & 1977 fingerprint in the world maps. The percentages point out that Loops are seen in a majority 50% of all fingers around the world.

**References**
Know your biodiversity

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Dromaius novaehollandiae

Dromaius novaehollandiae commonly known as Emus belongs to order Casuariiformes and Family Casuariidae. These birds are endemic to Australia where it is largest native bird and inhabits nearly the entire continent. Savannah forest, grassland, and subtropical climates are preferred by Dromaius novaehollandiae. They avoid heavily wooded areas and desertified regions, due to water needs. Emus are present above 330 m from mean sea level.

They have many physical characteristics in common with the ostrich, which are the only birds taller than the emu. Emus can reach a maximum height of 190 cm; with the average at 175 cm. Emus feet are similar in design to other running birds, having three forward-facing toes and no rearward-facing toes. Emus have long bare legs, similar to other flightless birds Ratites. They are the only bird with calf muscles, making them more adapted to sprinting and long distance running. These strength adaptations allow them to sustain speeds up to 13.4 m/s, with an average 3 meter stride. The high strength of these legs allows them to perform extremely powerful kicks capable of breaking through fences or maiming predators. The average weight is 36 to 40 kilograms, with females being slightly larger in size. Their plumage of shaggy dark brown feathers is not streamlined, as its main purpose is insulation from direct sunlight. This plumage has some variation due to environment, and will often reflect the general hue of its surroundings. Young emus will have additional camouflage in the form of longitudinal tan stripes on their much thinner plumage. Emus have very small vestigial wings capable of flapping, although they do not aid in mobility. They have a long, sparsely covered neck that is whitish-blue. Their heads are covered in wispy black feathers, and have a large black beak specialized for grazing.

These birds exhibit polyandrous breeding patterns, but not all females engage multiple partners. Mating season begins in December-January, which starts with the male and female emu engaging in a courtship dance. The result is dependent on the male emu's performance; if his performance is unsatisfactory, the female may become aggressive. Success of the male emu means up to five months of mating privileges with the courted female. Before the female emu lays her eggs, their male counterpart may court other females before being occupied with incubation. After the males begin the incubation period, the female emus will seek to mate with unoccupied males. Most female emus
engage in post-mating period polygamy, however not without a cost. Female emus run the risk of losing their mate, which could mean her eggs will not be incubated. To prevent this, some will guard the male from accessing other females. In the relationship, the female emu is most responsible for keeping order in the pair formation, until incubation begins when the male becomes aggressive to all other emus.

When emus reach sexual maturity at 18 to 20 months, they engage in mating practices. After pairing, emus will breed until eggs are laid. From insemination, this is 48 to 56 days. Female emus are able to store sperm, allowing them to continue laying eggs every 3 days after her initial clutch. This initial clutch can range from 5 to 24 eggs. She will create more nests if necessary, which will be incubated by another male emu. A single nest may contain the eggs of several females. Male emus are responsible for egg incubation, which starts after the last egg is laid in order to minimize the incubation period. In the incubation period, male emus generally do not consume food, drink, or pass waste; they are able to survive on stored fat alone. After 48 to 56 days of incubation, the all the eggs will hatch within a period of days. The average birth weight is 500 grams.

After female emus lay their eggs, they have little to do with them other than occasionally visiting the incubating male. Male emus are defensive toward all other emus, and takes great care in protecting the nest. Male emus find a suitable location for their mate's eggs, and will build up a bed of dead grass and foliage surrounded by larger brush. Because this nest is largely flat, male emus take special care to gather the eggs that roll away. Male emus rotate and turn the eggs every few hours to ensure consistency of incubation and hatching time. After hatching, males will protect the flock and teach them how to procure food. Males maintain their aggressive disposition toward all other emus, even the mother. This period of dependence lasts up to 7 months, after which the emus are fully grown. Emus are independent from the flock in 15 to 18 months.

When in captivity, under a regular hydration and feeding schedule, emus are able to live up to 20 years. Emus in the wild experience many more stresses, including dry periods and starvation, which reduces their lifespan to a max of ten years.

They are generally solitary birds, but exhibit social behaviours whenever advantageous. Emus are strictly diurnal. When they do sleep, they wake very often due to predatory threats and hydration needs. The home range of emus is 5 to 10 square km. This area is dynamic, as they are always on the move in search of water and food. They primarily feed on fruits, seeds, insects, and small animals. Emus will also feed on animal droppings, and will reject leaves and dry grasses. The primary predator of emus is dingoes. Dingoes mainly threaten the nests, consuming the eggs. One dingo will distract the incubating male, so that the nest becomes exposed. When attacking emus, predators will target the head and neck. To defend against dingo attacks, emus exploit their height by quickly leaping away. Against eagles and hawks, emus have little practical defense. The wedge-tailed eagle, will attempt to break their neck by tackling them after a dive. Emus can only run wildly and unpredictably, seeking covers (a rarity in their habitat).

The emu lives in abundance in mainland Australia. In Tasmania however, the population was decimated when it was hunted by European settlers. This species has an
extremely large range, and hence does not approach the thresholds for Vulnerable under the range size criterion. Thus, the species is evaluated as Least Concern according to IUCN red list.

*Thevetia peruviana*

*Thevetia peruviana* is a poisonous plant commonly known as Yellow oleander, Exile Tree, Tiger Apple and Peeli Kaner. This plant belongs to order Gentianales and Family Apocynaceae. *Thevetia peruviana* is a poisonous plant native to central and southern Mexico, West Indies and Central America, and cultivated widely as an ornamental commonly seen in parks and small gardens and frequent as an understory ‘filler’ along avenues. It is a relative of *Nerium oleander*, giving it a common name yellow oleander, and is also called lucky nut in the West Indies.

It is an evergreen tropical shrub or small evergreen tree. Its leaves are willow-like, linear-lanceolate. They are very slim, 9-14 cm, narrowed at both ends, with barely any noticeable leaf stalk colour of leaves are dark green and dully glossy on upper surface and paler beneath. The midrib is easily visible but the secondary veins are very faint. They are covered in waxy coating to reduce water loss (typical of oleanders). Its stem is green turning silver/gray as it ages. Flowers are trumpet shaped, up to 7 cm long, in long-stalked cluster. The 5 overlapping petals are joined into a tube at bottom. The stamens and stigma lie deep inside the tube. Flowers bloom in most of the year with a lean period from December to March and prime time of blooming is from June to September. The long funnel-shaped sometimes-fragrant yellow flowers are in few-flowered terminal clusters. Its fruit is deep red-black in colour encasing a large seed that bears some resemblance to a Chinese lucky nut. Fruit is an oddly shaped, smooth ‘apple’, somewhat like a rugby ball with a transverse ridge, notched at each end. The apples are green and milky when young but at ripening time the colour changed to dark brown and eventually black. In its native lands, the fruit is regarded as lucky charm, even though the plant is known to be poisonous. Bark is grey or grey brown, with a thin outer skin and shallow fissures forming as the tree matures and studded with lenticels. This plant reproduces by seed. Locally, it is also propagated by cuttings especially for use as a live hedge.

Yellow oleander is a shallow rooted tree that will survive in dry, nutrient poor conditions but prefers sandy, well drained, organically rich soils. It thrives in heat and full sun but is distinctly frost tender. Its precise origins in tropical America are somewhat obscure but hot dry parts of Mexico and the West Indies certainly form part of its native range. The plant is very widely cultivated throughout the tropics worldwide as an ornamental plant.

The milky sap contains a highly poisonous narcotic substance that can cause serious cardiac and gastrointestinal problems, leading eventually to death. The seeds yield bright-yellow oil that is used as purgative and emetic. Bark is used to treat fevers, but because of poisonous principle,
all parts of the plant must be used with extreme caution. The seed-oil is reputed to burn well without smoking. The term “oleander” basically refers to two plants, Nerium oleander (common oleander) and *Thevetia peruviana* (yellow oleander). Both plants contain heart-active “cardiac glycoside” chemicals (similar to the prescription drug digoxin), and have been associated with serious side effects in humans, including death. *Thevetia peruviana* is used medicinally throughout the tropics in spite of its toxicity. A bark or leaf decoction is taken to loosen the bowels, as an emetic, and is said to be an effective cure for intermittent fevers. In Senegal water in which leaves and bark were macerated is taken to cure amenorrhea. The plants have been used to treat heart failure in China and Russia for decades, but scientific evidence supporting use is limited to small, poorly designed studies. Human research began in the 1930s, but was largely abandoned due to serious gastrointestinal and heart toxicity. It should be noted that the drug digoxin may improve symptoms of congestive heart failure, but does not improve mortality (length of life). *T. peruviana* has been included in the Global Invasive species Database (GISD 2010). It has been listed as a noxious weed in South Africa (prohibited plants that must be controlled. They serve no economic purpose and possess characteristics that are harmful to humans, animals or the environment). The precise management measures adopted for any plant invasion will depend upon factors such as the terrain, the cost and availability of labour, the severity of the infestation and the presence of other invasive species. The best form of invasive species is management is prevention. If prevention is no longer possible, it is best to treat the weed infestations when they are small to prevent them from establishing (early detection and rapid response). Controlling the weed before it seeds will reduce future problems. Control is generally best applied to the least infested areas before dense infestations are tackled. Consistent follow-up work is required for sustainable management.

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