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Giving Wood Longer Life

Content of this Issue

Protecting Wood against Fungi

Melindungi Kayu daripada Kulat

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Fungi causing wood damage, *Lentinus sajor caju*

Wood is used in a broad range of applications and diverse environmental conditions which in turn, influence its service life. Protecting wood from deterioration is hard when it is exposed to elements that favour the growth of wood-destroying microorganisms. Resistance of wood against destroying fungi, molds and insects is a pertinent factor to be considered for outdoor structures where parameters such as moisture and humidity provide conducive growth environment.

Wood destroying fungi are grouped into three categories: brown rot, white rot and soft rot. Each category attacks specific chemical wood components namely cellulose, hemicellulose and lignin, respectively. When degrading fungi metabolise wood, the strength of timber is compromised. Nevertheless, not all fungi attack causes degradation. Mold for instance, only discolours or stains wood. These fungi typically develop when timber is not dried properly or humidity is too high. Stain fungi do not affect the strength of timber, but the stain itself devalues the timber as the appearance is considered unfavourable by the consumers.

The durability of wood to various decaying fungi is tested by using different standard methods which are useful to detect the inherent capability and degree of wood resistance. To protect wood from degradation and to enhance its value, wood must be preserved or treated to increase its resistance against attack by insects and fungi. The durability of wood is dependent upon the absorbed amount of preservative and its final placement. The requirements of effective wood preservatives include highly poisonous or toxic to fungi/insects; good penetrability and permanence (chemically stable for outdoor use and not readily volatilised, decomposed and leached out by water); safe for use and handling; harmless to wood and metals; and fire resistant. Wood can be treated using vacuum, pressure or non-pressure treatments, brushing, spraying or dipping. Proper selection of wood preservatives can also lengthen the service life of timber.

ABOUT THE AUTHOR

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What Do You Know about Fire Retardant

Apakah Yang Anda Ketahui tentang Perencat Api

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Dr Zaihan Jalaludin & Nor Azian Mohd Kasby

Fire is an important element in life. We cook, increase ambient temperature and melt iron for industrial purposes with fire. Fire can be dangerous, is a threat to both human life and property, and causes financial loss. Flame retardant materials are seen as an option to reduce the risk of catching fire in flammable materials such as wood and textile. The term 'fire retardant' though, refers to the function, and not the type of chemical used to retard fire. A variety of chemicals with different properties and structures are often combined to increase the effectiveness of a particular fire retardant.

The most common elements used in fire retardants are nitrogen, bromine, phosphorus and chlorine. Inorganic compounds such as monoammonium phosphate (MAP) and diammonium phosphate (DAP) are added, either as a single component or as part of a fire retardant system comprising bromine, phosphorus or nitrogen.

Fire retardants are added to different materials or applied as treatment to materials such as timber, textile and plastic to prevent, limit the spread of fire, or minimise resulting damage. Fire retardants work in two ways—effectively on their own or as synergists to increase the fire protective benefit of other fire retardants. A variety of fire retardants is necessary for effective protection due to the make up of a fire resistant product. The elements in fire retardants also react differently with fire. As a result, fire retardants have to be suited appropriately to each type of material. As fire retardants work to stop or delay fire, they interact at different stages of the fire cycle depending on their chemical composition.

Timber is a combustible material and must be treated with fire retardant to enhance its properties. A few methods to apply fire retardant on timber are possible. A simple application involves applying retardant onto product with brush, while the most effective way is by using pressure. Treating timber even at higher temperatures will not spoil its structural integrity and affect favourable properties for construction. Steel on the other hand, will lose its hardness rapidly to one-half of its breaking strength at 550°C, while at 750°C; up to 90% of its strength will be compromised. During fire, untreated timber will produce char to encapsulate the timber core; char is the carbon produced after hydrogen and oxygen are removed from heated timber. With application of fire retardant, the formation of char will be prolonged, as a result, it will extend the fire rating of timber.

In Malaysia, the Fire and Rescue Department Malaysia (FRDM) as the authority in building does not allow any application of fire retardant on building materials (including timber) during fire testing. However, one could take his own initiative to protect timber with fire retardant. The additional cost incurred by treatment of wood-based building components may provide long-term benefit in the form of fire safety and peace of mind to occupants of the building.

Fire test performance on treated timbers at the Fire Protection Laboratory. Fire retardant in liquid form (inset)

ABOUT THE MAIN AUTHOR

Khairul Azmi Jabar is the head of the Fire Protection Laboratory, FRIM. His MSc is in fire safety in heritage building from Universiti Sains Malaysia. He specialises in fire resistance testing and building fire safety, and was involved in several projects and consultations related to fire resistance.

Why Keep Timber Dry?

Mengapa Kayu Perlu Sentiasa Kering?

Zairul Amin Rabidin *zairulamin@frim.gov.my*
& Dr Gan Kee Seng

Drying, or seasoning, refers to the process of removing or reducing moisture in timber. The primary reason for drying timber is to ensure that the timber is dimensionally stable prior to its usage. In other words, timbers are allowed to shrink and distortion has occurred before further processing into required dimension. Other important benefits or drying timber include:

- Reduces weight—Drying removes most of the water in timber, and reduces transportation and handling costs.
- Reduced likelihood to fungal and insect attack—Drying timber immediately after sawing reduces susceptibility of timbers to fungal and insect infestation during transit, storage, and use. Dried timber of 20% moisture content and below is less susceptible to decay or sap staining fungi. Most boring insects including ambrosia beetles live in green timber and die as wood dries. Insects which infect the timber will die after the sterilisation process at temperatures of more than 60°C for a certain period of time.
- Improved efficacy of treatment—Drying timber below 20% moisture content facilitates impregnation of timber with preservative and fire-retardant chemicals. In the chemical modification process, wood should be dried to a certain moisture content level for effective reactions.
- Better gluing and finishing quality—Glue and finishes adhere better to dry wood. In the lamination process, timber should be dried to 12% moisture content before gluing for better adhesive bonding.
- Better machining quality—Except turning, dry timber can be easily and efficiently machined, producing more precise dimensions and smoother surface. Warping and checking are largely eliminated in dried wood during machining.
- Better fastener holding—Compared to green wood, dry wooden parts are readily fitted and fastened securely with nails, screws, and bolts to produce stronger joints.
- Increased strength and other properties of wood—Many important wood properties such as mechanical strength, hardness, and electrical, as well as thermal insulation properties of wood increase as moisture drops below the fibre saturation point (approximately 30% for most species).

Small pin-holes are common characteristic of defect in cengal. The holes are caused by ambrosia beetles boring into living trees. These beetles die when timber is seasoned

Light coloured timbers (above) like jelutung, sesenduk, rubberwood and pulai should be processed immediately, stacked and dried to avoid attack by the staining fungi. Application of anti-sapstain fungi solutions like boron compound may be necessary for temporary protection (below)

- Adds value—Proper drying of wood products before shipment increases timber value. Balau for example, is sold at RM3000/m^3, in the form of green sawntimber, but the price increases to RM5000/m^3 when dried.

ABOUT THE MAIN AUTHOR

Zairul Amin Rabidin is a research officer at the Wood Drying Laboratory, FRIM. His expertise is in the field of wood processing, particularly in drying and machining of wood.

Heat to Enhance Wood Quality

Haba untuk Meningkatkan Kualiti Kayu

Dr Sik Huei Shing *sik@frim.gov.my*
& Ramzul Iklas Ab Lah

Wood is a composite structure of various compounds namely comprising lignin, cellulose and hemicellulose made up of various elements such as carbon, oxygen, hydrogen and smaller quantities of other elements. Being a biological material, wood is relatively easy to work with, and friendly to the environment, as it is recyclable, reusable and biodegradable. Inevitably, wood will deteriorate over time. Enhancement of wood properties via heat treatment has resulted in reduced shrinkage and swelling; low equilibrium moisture content; as well as better weather and decay resistance.

Wood is a hygroscopic material which will readily absorb or expel moisture when exposed to high or low humidity conditions until equilibrium is reached. The dimensional stability of a particular wood is important to reduce incidents of undesirable or excessive 'movement' which could result in severe warping of finished wooden products during service.

There are various means to enhance the dimensional stability of wood including heat treatment. In heat treatment, no chemical or preservatives are used, yet wood with more superior properties is attained through modification in a controlled environment. The reduction of hygroscopic hemicelluloses observed in heat-treated wood is one of the main reasons for the improved dimensional-stability. In general, heat treatment for wood is carried out in a two-step process. Fresh or partially air-dried sawn timber is first subjected to kiln-drying to reduce the moisture content to a certain percentage and cooled down at the end of the normal drying stage. Next, wood is subjected to a second stage of heat treatment process for a specific duration at elevated temperatures, usually in the range of 150–250°C. The temperature and duration of heat treatment regimes are determined by the intended use and in-service condition of the heat-treated material.

Alternatively, heat treatment can be carried out in a single-step process using freshly sawntimber, with application of high initial temperature, or by gradually increasing to an optimum high heat treatment temperature. At elevated temperatures, drying and heat treatments occur simultaneously, though significant changes on the chemical composition of wood are more noticeable at an exposure of above 150°C. The initial treatment temperatures are however dependent on wood species. Hence, it is crucial to assess the heat-resistant threshold and the drying characteristics of various species prior to treatment to minimise wood degradation, which could lead to low production output.

High temperature-treated plantation timber

The heat treatment process is currently being developed by FRIM researchers, with close collaboration with industry partners in Senawang, Negeri Sembilan and Bintulu, Sarawak. Commercial high temperature systems are currently utilised to treat local plantation species such as the widely popular rubberwood, acacia wood and other mixed-light hardwood species.

ABOUT THE MAIN AUTHOR

Dr Sik Huei Shing is the Head of the Environmentally-Friendly Treatment of Wood Unit, Forest Products Division, FRIM. She has a BSc in Forestry from Universiti Putra Malaysia and a PhD from Universiti Kebangsaan Malaysia. Her research areas include environmentally-friendly processing of timber particularly in high temperature treatments of plantation timbers.

Is Your Child's Bed Safe?

Selamatkah Katil si Kecil Anda?

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Children are exposed daily to the risk of injury caused by inappropriately designed beds or cots and the materials and finishings used. Sharp edges, gaps and openings, protruding and folding parts, cords and ribbon, and small parts are some of the features that make children's bed unsafe, while the material and finishing of beds and cots could lead to chemical and thermal hazards.

There are generally three types of children's bed namely baby cot, children's bed, and bunk or high bed which are intended for children of different age groups. Baby cot as the name suggests is for infants of below 18 months. The children's bed is further categorised into three sub-types: cot bed, toddler bed and junior bed (intended for children of 18 months to four years). Junior bed can be used by children of four years and older. The bunk or high bed is used by children aged over six years including teenager and adult.

Parents should be aware of possible hazards that can be triggered by the bed's design, materials and finishing from reports of incidents associated with kids and beds. Risks could be in the form of head, neck or fingers entrapment at the base or in between the bed base, and other structures. Other possible hazards include entanglement of cords and ribbons; swallowing of small parts; suffocation of packaging materials; and biting that leads to the risk of poisoning.

Chemical hazards occur from the migration of synthetic or natural elements from coatings in the form of antimony, arsenic, barium, cadmium, chromium, lead, mercury and selenium that exceed the minimum requirements (BS 8509:2008+A1:2011 – Children's bed for domestic use. Safety requirements and test methods). The total content and emission of formaldehyde from textile components and timber-based board materials should not exceed the minimum requirements.

Method of assessing protruding parts of a cot for possibility of entanglement

The head probe (circular device) should pass through the opening to reduce the risk of head entrapment

Irregularly shaped, partially bound and V-shaped openings on the head or footboard can contribute to entrapment of the head and neck

Durability test for baby cot

Cylindrical and conical test probes with diameters measuring 25, 60, 75 and 80 mm are used to assess the risk of entrapment in or between bed base and other structures

Children's bed should fulfil the minimum requirements of flammability test for textile materials and have no flash effect to reduce the risk of thermal injury (BS 8509:2008+A1:2011). Apart from safety of design and material, children's bed should be structurally assessed and tested for strength and durability. FRIM Furniture Testing Laboratory provides these testing services whereby further information can be obtained from the author.

ABOUT THE AUTHOR

Siti Zaliha Ali is a research officer at the Furniture Testing Laboratory (FTL), under the Furniture Technology and Timber Engineering Programme. Her field of expertise is in furniture testing and testing requirements.

Concerted Effort in Glulam Fabrication

Usaha Menghasilkan Glulam

Dr How Seok Sean *howss@frim.gov.my*
Dr Mohd Omar Mohd Khaidzir & Dr Clarence Tan

Good team effort is one of the key elements for desirable, if not better results. At the FRIM Wood Lamination Laboratory, concerted effort was the key ingredient in successful fabrication of glue laminated (glulam) beams.

Prior to the Archidex 2017 exhibition, FRIM was approached by Tong Sim Wood Industries Sdn Bhd to jointly produce two units of arched glulam beams. Archidex is an annual industry trade event for architectural, interior design and building fraternities of the South East Asian region in promoting building and interior design materials. FRIM was invited to work hand in hand with Tong Sim and JOWAT Manufacturing (SEA) Sdn Bhd in promoting glulam as one of the building materials exhibited by JOWAT. The three parties worked with an adhesive producer in planning, discussing, troubleshooting, and actual fabrication of the glulam beams.

Most of the glulam fabrication facilities at FRIM Wood Lamination Laboratory are manually driven. The machineries, crampers and jigs are some of the tools that were introduced to the laboratory since 1980's. Despite most of these facilities were considered obsolete, fabricating tools such as the manually driven crampers and jigs were successfully revived into good working order and fit for fabrication. In fact, the simplicity of this type fabrication system involves a much lower capital investment and is still favoured and operating in some of the glulam manufacturing plants worldwide.

A sizable number of manpower is required during the cramping process. A group of 18 members involved in the fabrication were sourced from various units of the Forest Products Division, namely the Manufacturing and Prototyping Workshop, the Timber Engineering Laboratory, the Fire Protection Laboratory and the Log Processing Workshop, in addition to the original members from Tong Sim, JOWAT and the Wood Lamination Laboratory. Each group was assigned to specific tasks, from glue mixing and spreading, handling of laminates, cramping, nuts fixing, manual pushing of laminates into arched shape, to applying the right amount of clamping pressure. The team was briefed, underwent a simulation session and was mentally prepared prior to the actual day of lamination. Like an orchestra playing a symphony, every single step of the glulam process was arranged synchronously and concurrently. The entire process had to be conducted within a narrow span of time to prevent the adhesive from curing.

The old sayings of "no man's island" and "when strings gathered they make a chord" proved their relevance in this case, where teamwork not only delivered strength in the assigned task, but also provided insights to the crew on how united effort made difficult work possible and enjoyable.

Briefing session

The crew busy taking charge on the assigned tasks

Working crew with Tong Sim

Trimming off the unwanted edges of the arched beam is non-conventional to the sawing team, nonetheless experience help heaps!

The combined effort and meaningful output for the glulam industry might not be possible without the support from Dr Gan Kee Seng, FRIM Forest Products Director and Dr Clarence Tan from Tong Sim Wood Industries. Special tributes are also due to members from the multi-disciplinary units for their assistance and cooperation during the fabrication process (Abdul Ghani Mohamad, Mohamad Zaki Kamim, Mohamad Idris Mohamad Ullul Azemi, Ascem Kumari, Nasri Nasir, Muhammad Adzam Ahmad, Khairul Masseat, Che Muhammad Farid Che Saupi, Syarmiza Anuar Abdul Razak, Muhamad Sahrul Selamat, Zamri Zainuddin) and the sawmill team members.

A completed arched glulam beam

The final product is ready to be taken back by Tong Sim

ABOUT THE MAIN AUTHOR

The main author is a research officer at the Wood Lamination Laboratory. Her research interest is on finger-jointing and glue lamination.

Boardwalk from Local Timber

Pelantar daripada Kayu Tempatan

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Timber boardwalk is a wonderful and practical option for trail in domestic and commercial landscaping projects. Boardwalks using timber planks are built for pedestrian access into weak terrains around parks, wetlands and waterfronts. Aside from footpath, boardwalks were constructed to create commercial districts along sea sides and waterfronts.

Timber is one of the most suitable materials for surface and underwater applications that can withstand the offshore and near shore environments. Solid timber planks are widely used as boardwalk material in nature trail and recreation area to avoid synthetic pollution and damage to soil and seedlings.

Durability of timber is essential in boardwalk construction. The appropriate timber with adequate strength and acceptable durability should be selected to ensure the safety of pedestrians. In addition, tropical environment such as the Malaysian weather accelerates the attack of fungi and termite on timber materials. To ensure lasting service, timber can be chemically treated with chromate copper arsenate (CCA) or borate. The copper acts primarily to protect the wood against decay, fungi and bacteria, while the arsenic is the main insecticidal component of CCA, providing protection from wood attacking insects including termites and borers.

To lessen the effect of chemicals, boardwalks are built on concrete base to distance the wooden material from the ground. The resulting structure retains the original timber feature of the footpath.

At present, there is no national standard to regulate the use of local timber as boardwalk material. The only related local standard on specifications of Malaysian timbers for structural uses is MS 1714 (2003), which specifies a method of strength grading tropical hardwoods through visual assessment. Based on strength, durability and common uses, some of the suitable Malaysian timbers for making boardwalk are shown in the following table.

Common boardwalk structures used in gardens (left) and as footpath at FRIM campus (right)

Trade name	Botanical name	Durability
Balau	*Shorea* spp.	Durable to very durable
Bekak	*Amoora* spp.	Moderately durable
Belian	*Eusideroxylon zwageri*	Very durable
Bitis	*Madhuca* spp.	Durable
Cengal	*Neobalanocarpus heimii*	Very durable
Giam	*Hopea* spp.	
Kekatung	*Cynometra* spp.	Moderately durable
Keranji	*Dialium* spp.	
Kulim	*Scorodocarpus borneensis*	Moderately durable, resistant to marine borers
Mata ulat	*Kokoona* spp.	Moderately durable
Merbatu	*Parinari* spp.	
Mertas	*Ctenolophon parvifolius*	
Pauh kijang	*Irvingia malayana*	
Penaga	*Mesua ferrea*	
Penyau	*Upuna borneensis*	Very durable
Petaling	*Ochanostachys amentacea*	Moderately durable
Resak	*Vatica* spp.	Very durable
Tembusu	*Fagraea* spp.	Durable

ABOUT THE MAIN AUTHOR

Nor Marzuina FK Naysir is an assistant research officer at the Timber Processing Technology Programme, FRIM.

Sistem Pengurusan Kualiti FRIM: ke Arah Pensijilan Semula ISO 9001:2015

FRIM Quality Management System Towards ISO 9001:2015 Reaccreditation

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& Nur Farhana Jamaludin

Latihan komprehensif di Stesen Penyelidikan FRIM Jengka

Aktiviti sistem pengurusan kualiti merupakan amalan dan kepatuhan khususnya terhadap standard ISO 9001. Standard ini ialah piawaian antarabangsa bagi sistem pengurusan kualiti proses di sesebuah organisasi. Di Malaysia, amalan sistem pengurusan kualiti telah dilaksana secara menyeluruh dan selaras dengan penguatkuasaan Surat Pekeliling MAMPU bertarikh 1 Jun 2010 bertajuk 'Panduan Pelaksanaan MS ISO 9001: 2008 dalam Sektor Awam'. Hasil kajian terdahulu mendapati sistem pengurusan kualiti berupaya mempengaruhi produktiviti dan budaya kerja penjawat awam. Atas keperluan untuk meningkatkan tahap kualiti perkhidmatan dan sebagai jaminan kepada pelanggan, pada tahun 2007 FRIM telah mengorak langkah bagi mendapatkan persijilan ISO 9001:2000 secara korporat yang meliputi proses-proses utama. Pada tahun 2009, persijilan ISO 9001:2000 telah dinaik taraf mengikut keperluan ISO 9001:2008 yang memberi penekanan terhadap keberkesanan tindakan penambahbaikan.

Sistem pengurusan kualiti di kampus FRIM meliputi 10 proses utama dan 30 proses sokongan yang merentas bahagian serta berhubung kait antara satu sama lain. Pelaksanaan amalan kualiti selanjutnya diperluaskan ke stesen-stesen penyelidikan FRIM. Proses ini bermula pada tahun 2013 dengan pembangunan prosedur yang relevan dengan operasi di stesen penyelidikan. Latihan komprehensif merangkumi latih amal dan audit kualiti dalaman dijalankan di stesen-stesen terpilih iaitu Mata Ayer, Pasoh, Bidor, Jengka, Maran dan Setiu.

Pada September 2016, standard ISO 9001 dinaik taraf sekali lagi mengikut versi 2015 yang memberi penekanan terhadap penilaian risiko. Bagi menyahut cabaran tersebut, beberapa tindakan intensif diambil seperti memupuk kesedaran, memberi latihan, menyediakan manual baharu selaras dengan perubahan standard, dan membangunkan prosedur baharu pengurusan risiko selain meminda prosedur.

FRIM juga melaksanakan penilaian terhadap kesediaan warganya untuk menyesuaikan diri dengan perubahan standard. Penilaian persepsi penjawat awam dilaksana pada tahun 2016 yang melibatkan kajian impak sistem pengurusan kualiti terhadap produktiviti dan budaya kerja warga FRIM. Rumusan kajian mendapati warga FRIM telah bersedia dengan perubahan standard baharu. Warga FRIM juga berpandangan sistem pengurusan kualiti dapat memberikan manfaat dalam meningkatkan produktiviti dan bersedia menerapkan amalan tersebut sebagai satu budaya kerja. Pihak pengurusan FRIM pula diharap dapat merencana tindakan yang berupaya menggalakkan kerjasama dan semangat berpasukan, menganjurkan program berkaitan peningkatan integriti dan nilai-nilai murni, dan melaksanakan langkah-langkah penjimatan kos operasi. Kerjasama pengurusan adalah penting bagi memastikan tindakan penambahbaikan dijalankan secara berterusan, selaras dengan hasrat standard ISO 9001.

TENTANG PENULIS UTAMA

Suharti Samod ialah seorang pegawai penyelidik di Unit Pengurusan Kualiti. Beliau seorang pemegang BSc Perhutanan daripada Universiti Putra Malaysia. Tugas utama beliau di FRIM sejak tahun 2010 ialah sebagai penyelaras dokumentasi kualiti.

Kunjungan Mengusik Jiwa
A Touching Visit

Syahida-Emiza Suhaimi *syahida@frim.gov.my*
& Ida Suraini Abd Shukor

Sepuluh orang ahli perkumpulan wanita FRIM (PUSPANITA/PWFRIM) telah berkunjung ke Rumah Pengasih Warga Prihatin (RPWP), Kajang pada 20 Jun 2017 bersamaan 25 Ramadhan 1438. Rombongan yang diketuai Timbalan Pengerusi PUSPANITA, Dr Farah Fazwa Mohd Ariff telah menyampaikan sumbangan berupa wang tunai berserta pakaian. Peserta rombongan dibawa melawat asrama perempuan dan Kompleks Kemahiran Lelaki yang terletak di Sg Ramal Dalam dan Sg Ramal Luar, masing-masing.

Menjadi kebiasaan mereka, apabila menerima kehadiran pelawat, kesemua penghuni rumah turun menyambut kedatangan kami. Anak-anak comel, sekecil tiga tahun yang bertudung litup serba hitam telah dididik untuk berdisiplin dan sabar. Sambil bersalaman, mereka tidak henti-henti mengalunkan bacaan selawat. Usai acara sambutan, para murabbiyah atau guru-guru yang terdiri daripada pengasas dan sahabat rumah pengasih mengiringi kami ke dewan kecil untuk diberikan taklimat. Sumbangan FRIM disampaikan kepada Puan Roslina yang melafazkan akad diikuti oleh bacaan doa selamat. Kami dibawa melihat sekitar kawasan kediaman asrama perempuan dan sebuah perpustakaan kecil yang turut menempatkan ruang belajar anak-anak.

Perpustakaan kecil untuk kegunaan anak-anak perempuan

Anak-anak perempuan dan murabbiyah masing-masing

Rumah yang diubah suai menjadi asrama perempuan dan tempat tinggal para keluarga pengasas itu pada asalnya merupakan kediaman seorang pengasas yang telah mewakafkannya. Kemudahan dan infrastruktur rumah yang sederhana dimanfaatkan sepenuhnya bagi menampung penghuni seramai 250 orang, daripada bayi sehinggalah warga tua, dalam kalangan anak-anak yatim, golongan asnaf, ibu tunggal dan warga emas. Di beberapa bahagian rumah terdapat deretan pelbagai jenis mesin hasil pemberian orang ramai yang akan dibaiki dan dimanfaatkan oleh warga rumah pengasih.

Lawatan diteruskan ke Kompleks Kemahiran Lelaki yang menempatkan asrama lelaki yang dibina secara bergotong-royong daripada kontena terpakai. Tapak kompleks itu merupakan bekas kawasan pembuangan sampah yang telah diwakafkan. Kenderaan-kenderaan terpakai hasil sumbangan orang ramai memenuhi sebahagian kawasan yang bersempadan dengan sebatang sungai kecil. Ada antara kereta, bas dan van itu telah dibaiki, dicat semula dan digunakan oleh warga rumah pengasih.

Kehidupan penghuni kompleks ini sangat sederhana dengan infrastruktur yang sentiasa ditambah baik untuk menampung bilangan warga yang semakin meningkat. Selain ditekankan dengan pembelajaran Islamik, anak-anak dilatih dengan pelbagai kemahiran seperti mengecat

Anak-anak lelaki berselawat menyambut ketibaan ahli PUSPANITA dan PWFRIM

Berlatar belakang kontena yang masih dalam pembinaan sebagai tempat penginapan anak-anak lelaki

Sebahagian daripada anak-anak lelaki di dewan serbaguna, kompleks kemahiran lelaki

kereta, menjadi jurufoto dan video, menjahit, memasak dan mengasuh anak-anak kecil. Segala tugasan dan keperluan harian dilakukan bersama-sama bagi mengurangkan kos sara hidup. Para murabbi mengalu-alukan kehadiran orang awam sebagai sukarelawan secara sepenuh atau separuh masa bagi membantu dalam pelbagai bentuk aktiviti yang dijalankan. Antara saluran yang digunakan untuk mencapai khalayak yang meluas ialah Facebook, di bawah nama 'Warga Prihatin'.

Perbelanjaan pengurusan rumah pengasih mencecah sehingga enam angka sebulan, malah kos ini dibiayai sepenuhnya oleh para pengasas dan individu persendirian yang dikenali sebagai sahabat warga prihatin. Pendapatan dijana melalui penghasilan dan penjualan pakaian termasuk tudung berjenama Werda (butik di Bangi Central), menerima tempahan reka bentuk dan penghasilan kemeja-t, dan perkhidmatan agensi pelancongan Rarecation. Dalam keadaan yang serba memerlukan, mereka telah menyumbang kepada golongan senasib melalui Projek Pelangi yang berjaya menjahit lebih daripada 1000 helai baju raya untuk disedekahkan terutamanya kepada golongan asnaf.

Penghargaan dan terima kasih diucapkan kepada para dermawan, Tabung Kebajikan FRIM, Badan Kebajikan Islam, PUSPANITA dan PWFRIM yang menyumbang wang tunai, buku-buku dan pakaian. Kami juga mengucapkan terima kasih kepada pihak pengurusan serta pemandu FRIM yang membantu merealisasikan program ini. Kami bersyukur dapat memberikan sedikit kegembiraan kepada anak-anak rumah pengasih di saat menjelangnya Aidil Fitri.

TENTANG PENULIS UTAMA

Syahida Emiza Suhaimi ialah seorang pegawai penyelidik di Bahagian Biodiversiti Hutan, FRIM. Beliau telah berkhidmat di FRIM selama 12 tahun dan merupakan salah seorang ahli jawatankuasa PUSPANITA FRIM serta mantan ahli jawatankuasa PWFRIM 2014–2016.

Selasih Hitam for Health and Fitness

Selasih Hitam untuk Kesihatan dan Kecergasan

Dr Vimala Subramaniam
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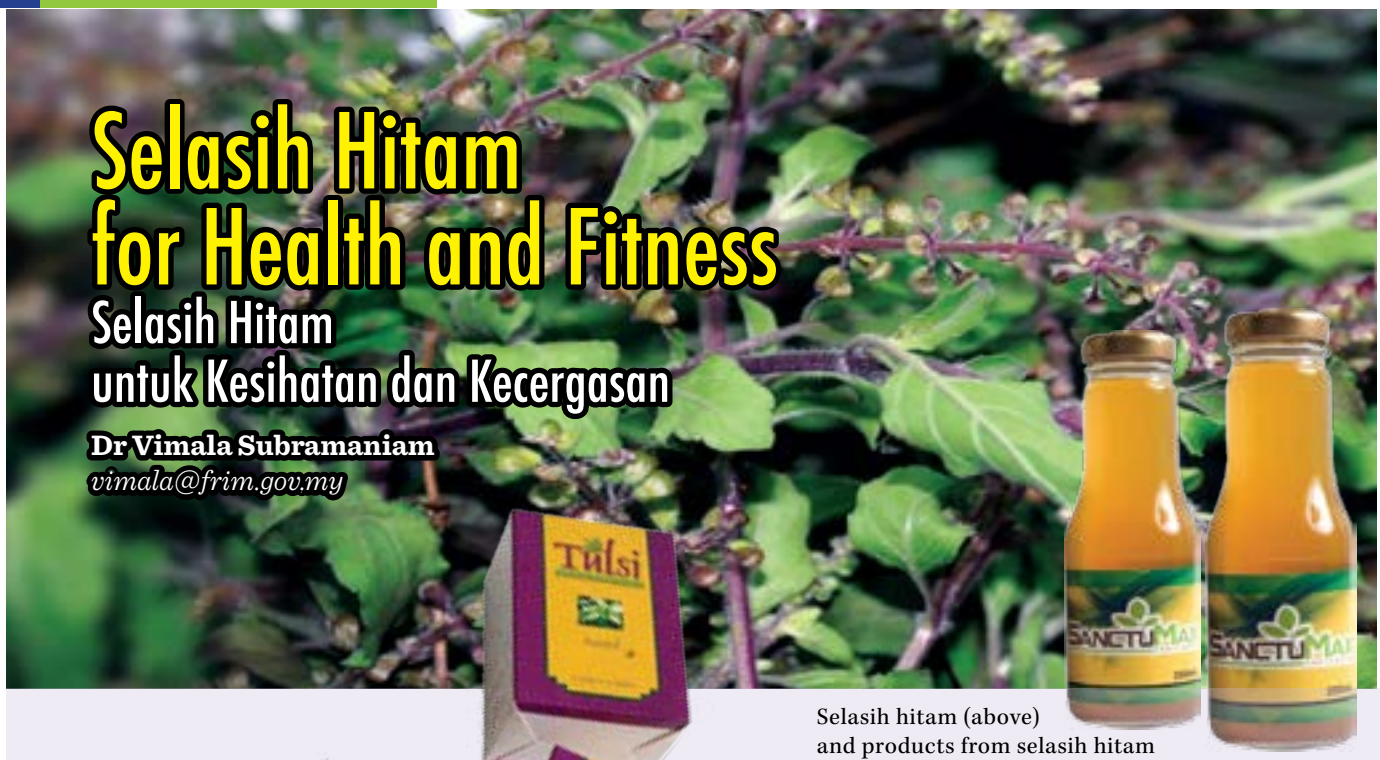

Selasih hitam (above) and products from selasih hitam

Ocimum sanctum, also known as selasih hitam, holy basil or tulsi is a herbaceous plant native to Malaysia dan India. The green leaves with purplish stem emit strong minty scent due to the high eugenol content (eugenol is a type of aromatic or essential oil present in plants such as clove, nutmeg, cinnamon, basil and bay leaf). Due to its great benefit to human health, selasih hitam is known to some as the goddess among herbs. For thousands of years, practitioners of traditional medicinal systems such as the Ayurvedic, Siddha, Chinese and African have used selasih hitam as tonic and adaptogen to reduce stress and nerve disorders. A daily intake of the leaves enhances immunity by increasing antibody production. Selasih hitam helps protect the respiratory system and strengthens the throat, chest and lungs, hence is used for the treatment of cold and coughs especially in children. It helps mobilise mucus in bronchitis and asthma while the leaves are also used to treat digestive disorders and intestinal infections.

Supply of herbal material remains an issue where local herbal industries still depend on imported raw material while scientific data for locally planted selasih hitam is scant. A study was conducted by FRIM and funded by the Ministry of Agriculture and Agro-Based Industry, to evaluate the antioxidant properties of selasih hitam. Antioxidants are bioactives responsible for well-being, fitness and rejuvenation. They boost the body's ability to fight off damaging free radicals, to prevent oxidative damage and degenerative age dependant, chronic conditions. Studies indicated selasih hitam leaf's high antioxidant capability is attributed to the polyphenolic compounds as shown by the profile generated through high performance liquid chromatography. Using the the selasih hitam standardised aqueous extract, FRIM eventually developed a series of natural antioxidant products for promoting health, fitness and rejuvenation.

ABOUT THE AUTHOR

Dr Vimala Subramaniam is a research officer at the FRIM Publications Branch. She is the recipient of various national and international awards for her findings in herbal research.

Pegawai FRIM Dilantik Semula Presiden, Ahli Exco MSPP

Presiden (tiga dari kanan) dan ahli exco (empat dari kanan) MSPP bagi penggal 2017–2019

21 Ogos 2017 Dr Ahmad Nazarudin Mohd Roseli dan Dr Lok Eng Hai dilantik semula sebagai Presiden dan Ahli Exco Persatuan Fisiologi Tumbuhan Malaysia (MSPP) bagi penggal 2017–2019 pada Mesyuarat Agung Tahunan MSPP ke-29 yang diadakan di Pulai Springs Resort, Johor. Sempena Persidangan MSPP ke-27 yang berlangsung 21–23 Ogos, ahli kumpulan penyelidik FRIM yang diketuai oleh Dr Farah Fazwa Mohd Ariff juga memenangi hadiah pertama dalam pembentangan poster bertajuk 'Effects of Soil Amendments on the Growth and Total Phenolic Content in *Labisia pumila* var. *alata* at Nursery Stage'.

FRIM Agensi Terbaik bagi Khidmat Pusat Pulih Bencana

1 Ogos 2017 FRIM menerima anugerah Agensi Terbaik bagi perkhidmatan pusat pemulihan bencana yang disampaikan di Putrajaya. FRIM adalah antara 50 agensi yang memperoleh perkhidmatan tersebut melalui projek 'Data Government Centre' (GDC-2) yang dilaksanakan kerajaan Malaysia bermula 2012 sehingga 2017. Menerusi Projek GDC-2, FRIM telah melaksanakan latihan simulasi pelan kesinambungan perkhidmatan yang melibatkan semua warganya pada 27 Julai. Pasukan pemulihan bencana FRIM berjaya mengaktifkan semua aplikasi kritikal dalam jangkamasa empat jam 16 minit berbanding kriteria enam jam yang ditetapkan.

Ketua pasukan pemulihan bencana FRIM, Maizura Ishak (tengah) menerima anugerah Agensi Terbaik bagi Khidmat Pusat Pulih Bencana

FRIM Terima Anugerah AKRAB

20 Julai 2017 Upacara penyerahan anugerah yang dimenangi AKRAB FRIM di peringkat Kementerian Sumber Asli dan Alam Sekitar (NRE) pada 19 Julai diadakan sempena perhimpunan bulanan FRIM. Anugerah AKRAB kategori organisasi dan individu diserahkan oleh Pengarah Bahagian Sumber Manusia dan pegawai Bahagian kepada Ketua Pengarah FRIM.

Penyerahan anugerah AKRAB kategori organisasi

Penyerahan anugerah AKRAB kategori individu

KP FRIM Terima Anugerah BrandLaureate Most Eminent Brand Icon Leadership

28 Ogos 2017 Ketua Pengarah FRIM, Dato' Dr Abd Latif Mohmod menerima anugerah 'BrandLaureate Most Eminent Brand Icon Leadership 2017' bagi kategori 'Pemuliharaan Alam Sekitar' di Kuala Lumpur yang disampaikan oleh Tan Sri Rainier Althoff, Pengerusi Asia Pacific Brands Foundation. Abd Latif telah dipilih sebagai penerima anugerah atas pencapaian dan sumbangan beliau kepada FRIM, khususnya dalam memperkasakan penyelidikan perhutanan dan konservasi ke arah memelihara warisan kebangsaan untuk generasi akan datang. Mantan KP FRIM yang pertama, Tan Sri Dr Salleh Mohd Nor merupakan salah seorang penerima 'The BrandLaureate Most Eminent Brand Icon Leadership Award' pada 2016.

KP FRIM (dua dari kiri) dengan Anugerah BrandLaureate

Majlis Korban Perdana 1NRE Meriah

3 September 2017 Kementerian Sumber Asli dan Alam Sekitar (NRE) mengadakan satu Perhimpunan Khas 1NRE bersama Menteri, Dato Sri Dr Wan Junaidi Tuanku Jaafar di FRIM, Kepong. Sempena sambutan Hari Raya Aidiladha, satu majlis korban juga diadakan di Masjid Jamek FRIM. Sambutan Ibadah Korban Perdana 1NRE ini julung-julung kali diadakan oleh NRE selaras dengan hasrat Menteri yang ingin meraikan sambutan dan perayaan bersama-sama warga NRE. Hampir 600 orang telah menghadiri majlis ini. Mereka terdiri daripada ketua-ketua jabatan, kakitangan serta ahli keluarga daripada semua agensi di bawah NRE, penghuni kuarters dan penduduk sekeliling kampus FRIM

Peserta Majlis Korban Perdana NRE