



**T**he goal of the Malaysian Oil Palm Genome Programme (MyOPGP) is to produce gold standard references of the *E. guineensis* (EG) and *E. oleifera* (EO) genomes, which have a genome size of ~1.8 Gb. The sequences of both of these species, EG and EO and the *shell* gene were recently published in two back-to-back landmark publications in the prestigious journal – *Nature* (Singh *et al.*, 2013a, b). Transcriptome from more than 30 samples were also sequenced to identify the gene populations in different oil palm tissues. The programme generated large amounts of data that is useful to the scientific and oil palm research community. The genomsawit web portal aims to facilitate access to the genome data and information. In August 2013, the genomsawit web portal was made accessible to the public. Construction of this web portal is very important, as it will help stimulate further innovations in biotechnological research and facilitate application of genomics and marker-based technologies in oil palm breeding and genetics.

## MATERIALS AND METHODS

Genomsawit interfaces were developed using HTML, CSS technologies, JavaScript and PHP (<http://www.php.net>). A relational database management system (RDBMS) MySQL 5.1.6 (<http://www.mysql.com>) was also implemented in the system. The web portal runs on the Red Hat Linux Centos 6.4 environment using web server Apache 2.2.15. The website link is accelerated by the use of the bootstrap package 2.3.2 while security features, such as CAPTCHA (Completely Automated Public Turing test to tell Computers and Humans Apart) (Ahn *et al.*, 2004) were also implemented. Google Analytics is used to monitor traffic in the genomsawit web portal.

## INFORMATION AVAILABLE

Genomsawit is divided into the public and registered users sections. The public section contains information related to oil palm, MyOPGP, epigenome, publications, latest news and contact details. Registered users are able to access the genome data and data analysis tools, such as Blast. Registration is free and open to all. The data download section contains the genome data for EG and EO, gene models, transcripts, markers and GeneThresher data. Each data category contains the sequence files, as well as a README and md5 file. README files give brief explanation of the sequences while the md5 of the sequence file is for users to check whether the downloaded file is complete. Sequence files are stored in compressed gz format files for easier download.

## BENEFITS OF GENOMSAWIT

- One-stop centre for oil palm genome information. The data is freely available for download and the publications associated with the data are shared with the users.
- Latest annotations and updates on the sequenced genomes are provided.
- Bioinformatics tools, such as the Blast program are made available to assist researchers carry out analysis via the genomsawit web portal.

## ACCESSIBILITY

The genomsawit web portal has been made available to the public since August 2013. It was developed using the latest open-sourced and bioinformatics tools, and is accessible via the Windows and Linux operating systems. The system was also developed to be a mobile-friendly web portal. Genomsawit is accessible at: <http://genomsawit.mpob.gov.my>.



## REFERENCES

AHN, L VON; BLUM, M and LANGFORD, J (2004). Telling humans and computers apart automatically. *Communications of the ACM*, 47 (2): 56-60.

SINGH, R; ONG-ABDULLAH, M; LOW, E T L; ABDUL MANAF, M A; ROSLI, R; RAJANAIDU, N; OOI, L C-L; OOI, S E; CHAN, K L; HALIM, M A; AZIZI, N; JAYANTHI, N; BACHER, B; LAKEY, N; SMITH, S W; HE, D; HOGAN, M; BUDIMAN, M A; LEE, E K; DESALLE, R; KUDRNA, D; GOICOECHEA, J L; WING, R A; WILSON, R K; FULTON, R S; ORDWAY, J M; MARTIENSSEN,

R A and SAMBANTHAMURTHI, R (2013a). Oil palm genome sequences reveals divergence of interfertile species in old and new worlds. *Nature*, 500(7462): 335-339.

SINGH, R; LOW, E-T L; OOI, L C-L; ONG-ABDULLAH, M; TING, N-C; JAYANTHI, N, RAJANAIDU, N; AMIRUDDIN, M D; ROSLI, R; ABDUL MANAF, M A; CHAN, K L; HALIM, M A; AZIZI, N; LAKEY, N; SMITH, S W; BUDIMAN, M A, HOGAN, M; BACHER, B; BRUNT, A V; WANG, C; ORDWAY, J M; SAMBANTHAMURTHI, R and MARTIENSSEN, R A (2013b). The oil palm SHELL gene controls oil yield and encodes a homologue of SEEDSTICK. *Nature*, 500(7462): 340-344.

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For more information, kindly contact:

Director-General  
MPOB

6 Persiaran Institusi, Bandar Baru Bangi,  
43000 Kajang, Selangor, Malaysia.

Tel: 03-8769 4400

Fax: 03-8925 9446

[www.mpob.gov.my](http://www.mpob.gov.my)