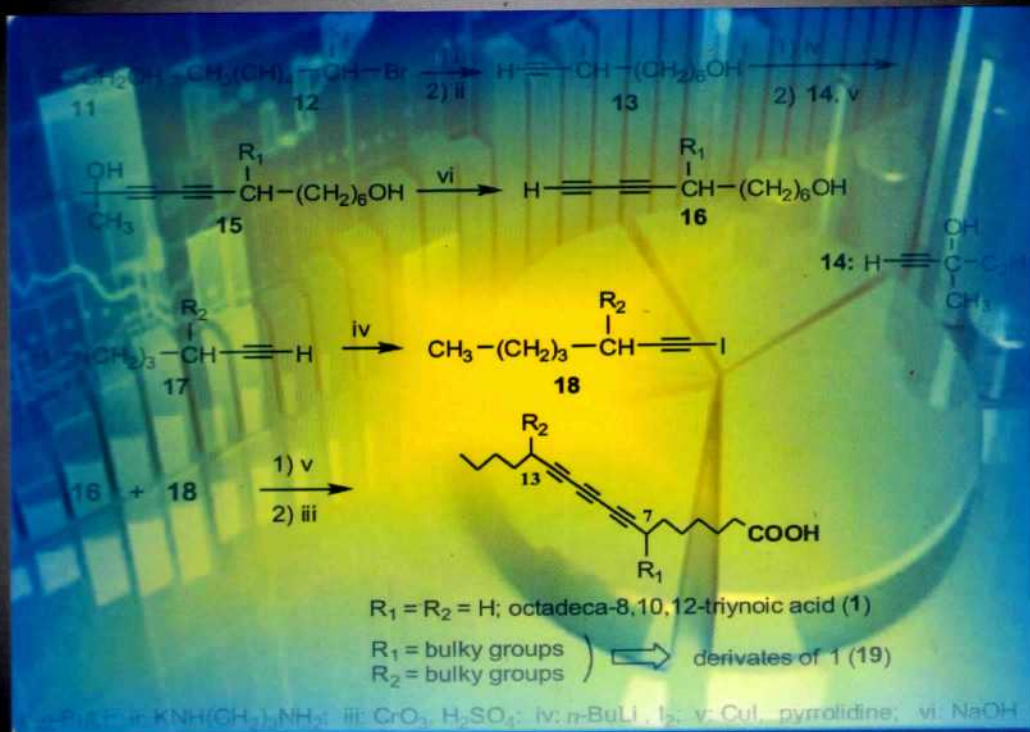


Berita Biologi

Jurnal Ilmu-ilmu Hayati



Berita **Biologi** merupakan Jurnal Ilmiah ilmu-ilmu hayati yang dikelola oleh Pusat Penelitian Biologi - Lembaga Ilmu Pengetahuan Indonesia (LIPI), untuk menerbitkan hasil karya-penelitian (original research) dan karya-pengembangan, tinjauan kembali (review) dan ulasan topik khusus dalam bidang biologi. Disediakan pula ruang untuk menguraikan seluk-beluk peralatan laboratorium yang spesifik dan dipakai secara umum, standard dan secara internasional. Juga uraian tentang metode-metode berstandar baku dalam bidang biologi, baik laboratorium, lapangan maupun pengolahan koleksi biodiversitas. Kesempatan menulis terbuka untuk umum meliputi para peneliti lembaga riset, pengajar perguruan tinggi maupun pekerjanya-tesis sarjana semua strata. Makalah harus dipersiapkan dengan berpedoman pada ketentuan-ketentuan penulisan yang tercantum dalam setiap nomor.

Diterbitkan 3 kali dalam setahun yakni bulan April, Agustus dan Desember. Setiap volume terdiri dari 6 nomor.

Surat Keputusan Ketua LIPI

Nomor: 1326/E/2000, Tanggal 9 Juni 2000

Dewan Pengurus

Pemimpin Redaksi

B Paul Naiola

Anggota Redaksi

Andria Agusta, Dwi Astuti, Hari Sutrisno, Iwan Saskiawan

Kusumadewi Sri Yulita, Marlina Ardiyani, Tukirin Partomihardjo

Desain dan Komputerisasi

Muhamad Ruslan, Yosman

Sekretaris Redaksi/Korespondensi Umum

(berlangganan, surat-menyurat dan kearsipan)

Enok, Ruswenti, Budiarjo

Pusat Penelitian Biologi—LIPI
Kompleks Cibinong Science Centre (CSC-LIPI)
Jin Raya Jakarta-Bogor Km 46,
Cibinong 16911, Bogor - Indonesia
Telepon (021) 8765066 - 8765067
Faksimili (021) 8765059
e-mail: berita.biologi@mail.lipi.go.id
ksama_p2biologi@yahoo.com
herbogor@indo.net.id

Keterangan gambar cover depan: *Aluryang dipercaya sebagai pathway sintesa kimia asam okta-8,10,12-triunoat, yang memiliki aktivitas antiproliferasi terhadap empat jenis galur sel kanker manusia, sesuai makalah di halaman 343 - H Winarno - Center for the Application of Isotopes and Radiation Technology - Badan Tenaga Atom Nasional.*



LIPI

Berita Biologi

Jurnal Ilmu-ilmu Hayati

ISSN 0126-1754

Volume 9, Nomor 4, April 2009

Terakreditasi A

SK Kepala LIPI

Nomor 14/Akred-LIPI/P2MBI/9/2006

**Diterbitkan oleh
Pusat Penelitian Biologi - LIPI**

Ketentuan-ketentuan untuk Penulisan dalam Jurnal Berita Biologi

1. Karangan ilmiah asli, *hasil penelitian* dan belum pernah diterbitkan atau tidak sedang dikirim ke media lain. Makalah yang sedang dalam proses penilaian dan penyuntingan, tidak diperkenankan untuk ditarik kembali, sebelum ada keputusan resmi dari Dewan Redaksi.
2. Bahasa Indonesia. Bahasa Inggris dan asing lainnya, dipertimbangkan.
3. Masalah yang diliput, diharapkan aspek "baru" dalam bidang-bidang
 - Biologi dasar (*pure biology*), meliputi turunan-turunannya (mikrobiologi, fisiologi, ekologi, genetika, morfologi, sistematik/ taksonomi dsbnya).
 - Ilmu serumpun dengan biologi: pertanian, kehutanan, peternakan, perikanan air tawar dan biologi kelautan, agrobiologi, limnologi, agrobioklimatologi, kesehatan, kimia, lingkungan, agroforestri.
 - *Aspek/pendekatan biologi* harus tampak jelas.
4. Deskripsi masalah: harus jelas adanya tantangan ilmiah (*scientific challenge*).
5. Metode pendekatan masalah: standar, sesuai bidang masing-masing.
6. Hasil: hasil temuan harus jelas dan terarah.
7. Kerangka karangan: standar.

Abstrak dalam bahasa Inggris, maksimum 200 kata, spasi tunggal, isi singkat, padat yang pada dasarnya menjelaskan masalah dan hasil temuan. Kata kunci 5-7 buah. *Hasil dipisahkan dari Pembahasan*.
8. Pola penulisan makalah: spasi ganda (kecuali abstrak), pada kertas berukuran A4 (70 gram), maksimum 15 halaman termasuk gambar/foto. Gambar dan foto harus bermutu tinggi; penomoran gambar dipisahkan dari foto. Jika gambar manual tidak dapat dihindari, harus dibuat pada kertas kalkir dengan tinta cina, berukuran kartu pos. Pencantuman Lampiran seperlunya.
9. Cara penulisan sumber pustaka: tuliskan nama jurnal, buku, prosiding atau sumber lainnya secara lengkap. Nama inisial pengarang(-pengarang) tidak perlu diberi tandatitik pemisah.
 - a. Jurnal

Premachandra GS, H Saneko, K Fujita and S Ogata. 1992. Leaf water relations, osmotic adjustment, cell membrane stability, epicuticular wax load and growth as affected by increasing water deficits in sorghum. *Journal of Experimental Botany* 43, 1559-1576.
 - b. Buku

Kramer PJ. 1983. *Plant Water Relationship*, 76. Academic, New York.
 - c. Prosiding atau hasil Simposium/Seminar/Lokakarya dan sebagainya:

Hamzah MS dan SA Yusuf. 1995. Pengamatan beberapa aspek biologi sotong buluh (*Sepioteuthis lessoniana*) di sekitar perairan pantai Wokam bagian barat, Kepulauan Aru, Maluku Tenggara. *Prosiding Seminar Nasional Biologi XI*, Ujung Pandang 20-21 Juli 1993. M Hasan, A Mattimu, JG Nelwan dan M Litaay (Penyunting), 769-777. Perhimpunan Biologi Indonesia.
 - d. Makalah sebagai bagian dari buku

Leegood RC and DA Walker. 1993. Chloroplast and Protoplast. In: DO Hall, JMO Scurlock, HR Bohlar Nordenkamp, RC Leegood and SP Long (Eds.). *Photosynthesis and Production in a Changing Environment*, 268-282. Chapman and Hall. London.
10. Kirimkan 2 (dua) eksemplar makalah ke Redaksi (alamat pada cover depan-dalam) yang ditulis dengan program Microsoft Word 2000 ke atas. Satu eksemplar tanpa nama dan alamat penulis (-penulis)nya. Sertakan juga copy file dalam CD (bukan disket), untuk kebutuhan Referee/Mitra bestari. Kirimkan juga filenya melalui alamat elektronik (e-mail) resmi Berita Biologi: berita.biologi@mail.lipi.go.id dan di-Cc-kan kepada: ksama_p2biologi@yahoo.com, herbogar@indo.net.id
11. Sertakan alamat Penulis (termasuk elektronik) yang jelas, juga meliputi nomor telepon (termasuk HP) yang dengan mudah dan cepat dihubungi.

Anggota Referee / Mitra Bestari

Mikrobiologi

Dr Bambang Sunarko (*Pusat Penelitian Biologi-LIPI*)
Prof Dr Feliatra (*Universitas Riau*)
Dr Heddy Julistiono (*Pusat Penelitian Biologi-LIPI*)
Dr I Nengah Sujaya (*Universitas Udayana*)
Dr. Joko Sulistyono (*Pusat Penelitian Biologi-LIPI*)
Dr Joko Widodo (*Universitas Gajah Mada*)
Dr Lisdar I Sudirman (*Institut Pertanian Bogor*)
Dr Ocky Kama Radjasa (*Universitas Diponegoro*)

Mikologi

Dr Dono Wahyuno (*BB Litbang Tanaman Rempah dan Obat-Deptan*)
Dr **Kartini** Kramadibrata (*Pusat Penelitian Biologi-LIPI*)

Genetika

Prof Dr Alex Hartana (*Institut Pertanian Bogor*)
Dr Warid Ali Qosim (*Universitas Padjadjaran*)
Dr Yuyu Suryasari Poerba (*Pusat Penelitian Biologi-LIPI*)

Taksonomi

Dr Ary P Keim (*Pusat Penelitian Biologi-LIPI*)
Dr Daisy Wowor (*Pusat Penelitian Biologi-LIPI*)
Prof (Ris) Dr Johanis P Mogeana (*Pusat Penelitian Biologi-LIPI*)
Dr Rosichon Ubaidillah (*Pusat Penelitian Biologi-LIPI*)

Biologi iVlolekuler

Dr Eni Sudarmonowati (*Pusat Penelitian Bioteknologi-LIPI*)
Dr Endang Gati Lestari (*BB Litbang Bioteknologi dan Sumberdaya Genetik Pertanian-Deptan*)
Dr Hendig Sunarno (*Badan Tenaga Atom Nasional*)
Dr I Made Sudiana (*Pusat Penelitian Biologi-LIPI*)
Dr Nurlina Bermawie (*BB Litbang Tanaman Rempah dan Obat-Deptan*)
Dr Yusnita Said (*Universitas Lampung*)

Bioteknologi

Dr Andi Utama (*Pusat Penelitian Bioteknologi-LI PI*)
Dr Nyoman Mantik Astawa (*Universitas Udayana*)

Veteriner

Prof Dr Fadjar Satrija (*FKH-IPB*)

Biologi Peternakan

Prof (Ris) Dr Subandryono (*Pusat Penelitian Ternak-Deptan*)

Ekologi

Dr Didik Widyatmoko (*Pusat Konservasi Tumbuhan-LIPI*)
Dr Dewi Malia Prawiradilaga (*Pusat Penelitian Biologi-LIPI*)
Dr Frans Wospakrik (*Universitas Papua*)
Dr Herman Daryono (*Pusat Penelitian Hutan-Dephut*)
Dr Istomo (*Institut Pertanian Bogor*)
Dr Michael L Riwu Kaho (*Universitas Nusa Cendana*)
Dr **Sih** Kahono (*Pusat Penelitian Biologi-LIPI*)

Biokimia

Prof Dr Adek Zamrud Adnan (*Universitas Andalas*)
Dr Deasy Natalia (*Institut Teknologi Bandung*)
Dr Elfahmi (*Institut Teknologi Bandung*)
Dr Herto Dwi Ariesyadi (*Institut Teknologi Bandung*)
Dr Tri Murningsih (*Pusat Penelitian Biologi -LIPI*)

Fisiologi

Prof Dr Bambang Sapto Purwoko (*Institut Pertanian Bogor*)
Dr Gono Semiadi (*Pusat Penelitian Biologi-LIPI*)
Dr Irawati (*Pusat Konservasi Tumbuhan-LIPI*)
Dr Nuril Hidayati (*Pusat Penelitian Biologi-LIPI*)
Dr Wartika Rosa Farida (*Pusat Penelitian Biologi-LIPI*)

Biostatistik

Ir Fahren Bukhari, MSc (*Institut Pertanian Bogor*)

Biologi Perairan Darat/Limnologi

Dr Cynthia Henny (*Pusat Penelitian Limnologi-LIPI*)
Dr Fauzan Ali (*Pusat Penelitian Limnologi-LIPI*)
Dr Rudhy Gustiano (*Balai Riset Perikanan Budidaya Air Tawar-DKP*)

Biologi Tanah

Dr Rasti Saraswati (*BB Sumberdaya Lahan Pertanian-Deptan*)

Biodiversitas dan Iklim

Dr Rizaldi Boer (*Institut Pertanian Bogor*)
Dr. Tania June (*Institut Pertanian Bogor*)

Biologi Kelautan

Prof Dr Chair Rani (*Universitas Hasanuddin*)
Dr Magdalena Litaay (*Universitas Hasanuddin*)
Prof (Ris) Dr Ngurah Nyoman Wiadnyana (*Pusat Riset Perikanan Tangkap-DKP*)
Dr Nyoto Santoso (*Lembaga Pengkajian dan Pengembangan Mangrove*)

Berita Biologi menyampaikan terima kasih
kepada para Mitra Bestari/Penilai (Referee) nomor ini
9(4)-April 2009

Prof. Dr. Adek Zamrud Adnan - *Universitas Andalas*
Dr. Ary P Keim - *Pusat Penelitian Biologi-LIPI*
Dr. Chaerani - *BB Litbang Bioteknologi dan Sumberdaya Genetik Pertanian*
Dr. Elfahmi - *Institut Teknologi Bandung*
Dr. Heddy Julistiono - *Pusat Penelitian Biologi-LIPI*
Dr. Ingrid S Surono, MSc - *SEAMEO Tropmed RCCN - Universitas Indonesia*
Dr. Irawati - *Pusat Konservasi Tumbuhan-LIPI*
Nyoto Santoso, MSc - *Lembaga Pengkajian dan Pengembangan Mangrove*
Dr. Sih Kahono - *Pusat Penelitian Biologi-LIPI*
Dr. Tjandra Chrismadha - *Pusat Penelitian Limnologi-LIPI*
Dr. Ir. Warid Ali Qosim, MSc. - *Universitas Padjajaran*
Dr. Yusnita Said - *Universitas Lampung*

Referee/Mitra Bestari Undangan
Ir. Heryanto MSc - *Pusat Penelitian Biologi-LIPI*
Drs. Mustarim Siluba - *Pusat Penelitian Biologi-LIPI(Purnabhakti)*
Hari Nugroho, SSi. - *Pusat Penelitian Biologi-LIPI*

DAFTAR ISI

MAKALAH HASIL RISET (ORIGINAL PAPERS)

ANTIPROLIFERATIVE ACTIVITY OF OCTADECANOIC ACID AGAINST HUMAN CANCER CELL LINES [Antiproliferasi Asam Oktadeka-8,10,12-triunoat Terhadap Galur Sel Kanker Manusia] <i>Hendig Winarno</i>	343
KEANEKARAGAMAN DAN SEBARAN SERANGGA DI KAWASAN PULAU-PULAU KECIL TAMAN NASIONAL KARIMUN JAWA [Diversity and Distribution of Insects in Small Islands of Karimunjawa National Park] <i>Erniwati</i>	349
STRUKTUR DAN KEKAYAAN JENIS TUMBUHAN MANGROVE PASCA-TSUNAMI DI PULAU NIAS [Structure and Species richness of Mangroves Plant Post-Tsunami in Nias island] <i>Onrizal dan Cecep Kusmana</i>	359
PENGARUH EKSTRAK AIR DAN ETANOL <i>Alpinia</i> spp. TERHADAP AKTIVITAS DAN KAPASITAS FAGOSITOSIS SEL MAKROFAG YANG DIINDUKSI BAKTERI <i>Staphylococcus epidermidis</i> SECARA <i>IN-VITRO</i> [The Effect of Water and EtOH extracts of <i>Alpinia</i> spp. to <i>in-vitro</i> Phagocytosis Activity and Capacity Macrophage Cells Induced by <i>Staphylococcus epidermidis</i>] <i>Dewi Wulansari, Praptiwi dan Chairul</i>	365
KOMUNITAS CACING TANAH PADA BEBERAPA PENGGUNAAN LAHAN GAMBUT DI KALIMANTAN TENGAH [Earthworms Community on Several Land uses of Peat Land in Central Kalimantan] <i>Eni Maftu'ah dan Maulia Aries Susanti</i>	371
KEANEKARAGAMAN FAUNA IKAN EKOSISTEM MANGROVE DI KAWASAN TAMAN NASIONAL UJUNG KULON, PANDEGLANG-BANTEN [Biodiversity of Fish Fauna Mangrove Ecosystem at Ujung Kulon National Park, Pandeglang-Banten] <i>Gema Wahyudewantoro</i>	379
(-)-(2R,3S)-DIHIDROKUERSETIN, SUATU PRODUK BIOTRANSFORMASI (-)-EPIKATEKIN OLEH JAMUR ENDOFIT <i>Diaporthe</i> sp. E [(-)-(2R,3S)-Dihydroquercetin, a Biotransformation Product from (-)-Epicatechin by the Endophytic Fungus <i>Diaporthe</i> sp. E] <i>Andria Agusta</i>	387
PENGARUH PENINGKATAN KONSENTRASI AMONIUM TERHADAP PERKEMBANGAN <i>Meloidogyne javanica</i> PADA KULTUR AKAR TOMAT [Effect of Increasing Ammonium Concentrations on Development of <i>Meloidogyne javanica</i> in Tomato Root Culture] <i>Sudirman</i>	393
PERSEBARAN DAN POLA KEPADATAN MOLUSKA DI HUTAN BAKAU [Distribution and Pattern of Species Abundance of Mangrove Molluscs] <i>Arie Budiman</i>	403

INDUKSI KERAGAMAN SOMAKLONAL DENGAN IRADIASI SINAR GAMMA DAN SELEKSI <i>IN VITRO</i> KALUS PISANG RAJABULU MENGGUNAKAN ASAM FUSARAT, SERTA REGENERASI DAN AKLIMATISASI PLANTLET [Gamma Irradiation for Somaclonal Variation Induction and <i>in vitro</i> Selection Using Fusaric Acid in Pisang Rajabulu calli Along with Regeneration and Plantlet Acclimatization] <i>Endang G Lestari, R Purnamaningsih, I Mariska dan Sri Hutami</i>	411
PENGARUH MUTAGEN ETIL METAN SULFONAT (EMS) TERHADAP PERTUMBUHAN KULTUR <i>IN VITRO</i> ILES-ILES (<i>Amorphophallus muelleri</i> Blume) [Effects of Ethyl Methane Sulphonate {EMS} on Growth of lies-lies (<i>Amorphophallus muelleri</i> Blume) <i>in vitro</i> Cultures] <i>Yuyu S Poerba, Aryani Leksonowati dan Diyah Martanti</i>	419
KANDUNGAN SELENIUM DALAM HERBA TERSELEKSIDARI DAERAH VULKANIS DAN AKTIVITAS GLUTATION PEROKSIDASE SERTA PENGARUHNYA TERHADAP PENYUSUTAN SEL MODEL <i>Saccharomyces cerevisiae</i> JB3505 [Selenium Content in Selected Herbs from Volcanic Area and its Functional Gluthathione Peroxidase and Cell Shrinkage Effect on <i>Saccharomyces cerevisiae</i> JB3505] <i>Sri Hartin Rahaju</i>	427
EKSTRAK DAUN MINDI (<i>Melia azedarach</i>) SEBAGAI BIOINSEKTISIDA UNTUK PENGENDALIAN INFEKSI <i>Chrysomya bezziana</i> PADA DOMBA [Methanolic Extract of Mindi Leaf (<i>Melia azedarach</i>) as a Bioinsecticide for Controlling <i>Chrysomya bezziana</i> Infection in Sheep] <i>YulvianSani</i>	433
KEANEKARGAMAN FLORA ANGGREK (ORCHIDACEAE) DI CAGAR ALAM GUNUNG SIMPANG, JAWA BARAT (Floristic Study on the Orchids (Orchidaceae) in Gunung Simpang Nature Reserve, West Java] <i>Diah Sulistiarini</i>	447
PALMS DIVERSITY, COMPOSITION, DENSITY AND ITS UTILIZATION IN THE GUNUNG HALIMUN SALAK NATIONAL PARK, WEST JAVA-INDONESIA WITH SPECIAL REFERENCE TO THE KASEPUHAN CIPTAGELAR [Diversitas Palm, Komposisi, Densitas dan Pemanfaatannya di Taman Nasional Gunung Halimun-Salak dengan Referensi Khusus pada Kasepuhan Ciptagelar] <i>Wardah and JP Moge</i>	453

PALMS DIVERSITY, COMPOSITION, DENSITY AND ITS UTILIZATION
IN THE GUNUNG HALIMUN SALAK NATIONAL PARK, WEST JAVA-INDONESIA
WITH SPECIAL REFERENCE TO THE KASEPUHAN CIPTAGELAR¹

[Diversitas Palm, Komposisi, Densitas dan Pemanfaatannya di Tainan Nasional Gunung
Halimun-Salak dengan Referensi Khusus pada Kasepuhan Ciptagelar]

Wardah^{e*} and JPMogea
Bidang Botani, Pusat Penelitian Biologi - LIPI
Jl. Raya Bogor-Jakarta Km 46, Cibinong 16911
*herbogor@indo.net.id

ABSTRACT

Palms diversity, composition, and density in six selected sites of 15 rectangular plots of 100 x 20 m were successfully studied. The sites are in Kasepuhan Ciptagelar, which located in the Gunung Halimun Salak National Park in West Java. The sites are in the disturbed primary submontane forest at 800 to 1400 m altitude. Ethnobotanical observations made in some of the villages in Kasepuhan Ciptagelar proceeded through informal unending open interviews involving some traditional elders, prominent communities, and handicraftsmen. There is no species addition to the park from the Kasepuhan Cigelar. Three species of rattans (*Calamus polysiachys*, *C. burcklanus*, and *Korthalsia laciniosa*) are added to the park from Cibedug, Leuwijamang, Ciptarasa, and Cikidang. Young leaves of *Daemonorops rubra* are used for traditional Inner Baduy cloth. The use of *C. javensis* canes for bracelets and rings, and the infructescence of *Plectocomia elongata* for decoration are new findings.

Key words: Palm diversity, composition, density, Gunung Halimun-Salak National Park, Kasepuhan Cipta Gelar, West Java.

INTRODUCTION

Mounts Halimun Salak National Park (GHSNP, previously Gunung Halimun National Park/GHNP) is one of the largest submontane forest conservation areas encompassing an area of 113,000 hectares including Mount Endut in the north west and Mount Salak in the east of the park (Fig. 1). Many notable biologists recognized the park as one of the richest biodiversity hot spots in the world (Miura, 2004), thus many biological researches have been proceeded there including recent studies on the composition, diversity, and utilization of rattans in 14 localities within GHNP (Kalima, 1996; Mogea, 2002; Harada et al., 2005). In order to have a more complete data from the National Park, the study was conducted in Kasepuhan Ciptagelar from 2nd to 16th of June, 2006. The previous data from the Inner Baduy (Wardah 2004), Leuwijamang, Cibedug, Ciptarasa (Harada et al. 2005), and Kasepuhan Cisungsang (Wardah 2005) are also incorporated. The vegetation in the park is mostly dominated by *Altingia excelsa*, *Schima wallichii*, *Castanopsis acuminatissima*, and *C. javanica* (Suzuki et al., 1998.).

MATERIALS AND METHODS

The palm population in the GHSNP is diverse and has a mosaic geographical distribution pattern. Therefore, in order to effectively observe them in the field some localities and sites were selected after discussions with local people, who traditionally knows the palms population in the area. Regarding the palms utilization, 10 traditional elders, leaders, prominent communities, and handicraftsmen in some villages of the Kasepuhan Ciptagelar were interviewed implementing the informal unending open interview method.

In Kasepuhan Ciptagelar the base camp is located at S 6° 48.143 'Sand 106° 29.931 'E. Twelve non permanent plots in six sites (1 to 3 km distances from the base camp) were established for the study on the diversity, composition, and density of palms (Table 1, column 3). They are Lolongokan, Ciruas, Terowongan, Pangkulahan Hill, Lebak Seueur, and Cibareno, in which all are of submontane forests. Table 1 shows the distances, altitude, and coordinate for each of the sites based on data supplied by GPS and topographic map (Anonym, 1999).

Diterima: 18 Januari 2009 - Disetujui: 13 Maret 2009



Fig. 1. Map of study sites in Gunung Halimun Salak National Park. Map of West Java: 1= Baduy Dalam (450 - 750 m), 2 = Pameungpeuk (850 - 1,210 in), 3 = Cangkung A (1,000 - 1,100 m), 4 = Cangkung B (1,000 - 1,050 m), 5 = Cileungsi (900 m), 6 = Kasepuhan Ciptagelar (800 - 1,400 m), 7 = Gunung Kencana (850 - 1,210 m), 8 = Gunung Botol (1,700 - 1,750 m), 9 = Cikudapaeh - Citalahap (1,130 - 1,150 m), 10 = Pasir Baut (1,130 - 1,1340 m), 11 = Cikopo - Ciangsana (1,030 - 1,040 m), 12 = Citalahap - Cikaniki (1,100 m), 13 = Cikaniki (1,100 m), 14 = Kasepuhan Cisungsang (700 - 720 m and 1,050 - 1,200 m), 15 = Cikidang (1,100 - 1,400 in), 16 = Gunung Pangkulahan (1,000 - 1,400 m), 17 = Cibedug (1,000 m), Leuwijamang (1,000 m), and Ciptarasa (1,000 - 1,000).

Table 1. The names, numbers and distances of the plots to the base camp in Kasepuhan Ciptagelar with their altitudes and coordinates.

No.	Locations	Distance	Altitude (m)	Coordinate
1	2	3	4	5
1	Ciptagelar (Base Camp)	0	1100	S 6° 48.143' E 106° 29.931'
2	Lolongokan (2)	2.5	1400	S 6° 48.263' E 106° 30.902'
3	Ciruas (3)	2.4	1395	S 6° 48.262' E 106° 30.822'
4	Terowongan (3)	1.5	1150	S 6° 48.135' E 106° 30.162'
5	G. Pangkulahan (2)	1.0	1200	S 6° 48.405' E 106° 30.729'
6	Lebak Seueur (2)	1.6	1150	S 6° 48.567' E 106° 29.810'
7	Cibareno (3)	3.0	800	S 6° 48.756' E 106° 30.054'

Each plot is 100 m by 20 m in size and each site has two or three plots indicated by the number in brackets following the site name (Table 1, column 2).

In this current study the tree and understory palms including rattans that possess length of individual stem 50 cm long or more was recorded as one individual plant, thus a rattan cluster is counted as more than one individual stems. Each plot then was divided into 20 rectangular 10 by 10 m subplots. The palm individual number in each plot was indicated as:

- a.O for absence,
- b.20 for number of individuals between 1 to 20,
- c. 50 for between 21 to 50,
- d.100 for 51 to 100, and
- e. 150 for 101 or more.

To assume the rate of cane harvesting, a note concerning the length of the individual rattan stem was added. Complete herbarium or voucher specimens were collected following Dransfield (1974). A temporary semi permanent preservation of the herbarium specimen was conducted in the field following a modification of Schweinfurth Technique (Steenis, 1950).

RESULTS

Kasepuhan Ciptagelar is a Banten Kidul cultural entity covering an area approximately 2,500 hectares, mostly located in the District Sukabumi of West Java Province. For generations the leader of the tribe comes from a closed and large family. At present the tribe is lead by Encup Sucipta and widely known as

Table 2. The distribution and average number of palm individuals observed in six sites within Kasepuhan Ciptagelar.

No.	Botanical name	Local name	L	C	T	P	S	R	A1	A2
1	2	3	4	5	6	7	8	9	10	11
01	<i>Pinanga coronata</i>	Bingbin	100	100	100	100	100	150	108.7	36.2
02	<i>Calamus javensis</i>	Hoe cacmg	100	50	100	50	50	100	75.0	25.0
03	<i>C. heteroideus</i>	Hoe korod	20	100	20	100	100	100	73.3	24.4
04	<i>D. melanochaetes</i>	Hoe seel	100	100	100	50	50	20	70.0	23.3
05	<i>Nenga pumila</i>	Ngenge	20	50	50	100	50	20	48.7	16.2
06	<i>P. elongata</i>	Hoe bubuai	SO	50	50	50	50	20	45.0	15.0
07	<i>D. oblonga</i>	Hoe teuretes	100	0	100	0	0	20	36.7	12.2
08	<i>Calamus ciliaris</i>	Hoe peteuy	0	20	0	20	20	100	26.7	8.9
09	<i>D. rubra</i>	Hoe pelah	0	50	0	50	20	20	23.7	7.9
10	<i>C. rhomboideus</i>	Hoe dawuh	20	20	20	20	20	20	20.0	6.7
11	<i>Caryota mitis</i>	S a r a i	0	20	0	20	20	20	13.7	4.6
12	<i>K. junghuhnii</i>	Hoe sampang	0	0	0	20	20	20	10.0	3.3
13	<i>Pinanga javana</i>	Hanyawar	0	0	0	0	0	20	3.3	1.1
14	<i>Arenga pinnata</i>	Kawung	0	20	0	0	0	0	3.3	1.1
15	<i>C. asperimus</i>	Hoe leuleus	0	0	0	0	0	20	3.3	1.1
			8	11	8	11	11	14		

Note: Column 2; C = *Calamus*, D = *Daemonorops*, K = *Korthahia*, P = *Plectocomia*; Site: L = Lolongokan, C = Ciruas, T = Terowongan, P = Gunung Pangkulahan, S = Lebak Seueur, R = Cibareno, A1 = individual numbers in 3 hectares, A2 = individual numbers per hectare.

Abah Anom.

The tribe has about 1,000 families and has been practicing shifting cultivation for ages. They have moved from one place to another. For the past 57 years they have moved for seven times. During Japanese occupation (1942 to 1945) they lived in Cicadas and Ciceumet. After the independence (1945) they moved to Simaresmi then to Simarasa (1974), Linggarjati (1981), Ciptarasa (1984) and since 2001 in Ciptagelar (Fig 1). These villages are all located near or within the National Park such as Sarongge in the northern and Nirmala enclaves in the center part of the park. The density and distribution of palms observed in Kasepuhan Ciptagelar is presented in table 2.

There are 15 species of palms observed in Kasepuhan Ciptagelar, in which five species are tree palms: *Pinanga coronata*, *Nenga pumila*, *Caryota mitis*, *Pinanga javana*, and *Arenga pinnata*. The first three species are clustered palms, whereas the rest are solitary. They are distributed from 800 m altitude in Cibareno to approximately 1,400 m in Lolongokan.

The climbing palms (rattans) are consisted of five species of *Calamus* (*C. javensis*, *C. heteroideus*,

C. ciliaris, *C. rhomboideus*, and *C. asperimus*), three species of *Daemonorops* (*D. melanochaetes*, *D. oblonga*, and *D. rubra*), and each species of the genus *Plectocomia* (*P. elongata*) and *Korthalsia* (*K. junghuhnii*).

The species distribution in the Kasepuhan Ciptagelar are diverse. Lolongokan and Terowongan each has 8 species, Ciruas, Gunung Pangkulahan, and Lebak Seueur each has 11 species, and Cibareno has 14 species.

Pinanga coronata has the highest density with 108.7 individuals in 15 plots (equals to 3 hectares), which means 36.2 individual per hectare. Followed by *C. javensis*, *C. heteroideus*, and *D. melanochetes*, in which each has 25.0, 24.4, and 23.3 individuals per hectare.

The rest of the species have less than 20 individuals per hectare, namely *Nenga pumila* (16.2 individuals per hectare), *Plectocomia elongata* (15.0 individuals per hectare), *Daemonorops oblonga* (12.2 individuals per hectare), *C. ciliaris* (8.9 individuals per hectare), *D. rubra* (7.9 individuals per hectare), *C. rhomboideus* (6.7 individuals per hectare), *Caryota*

mitis (4.6 individuals per hectare), *Korthalsia junghuhnii* (3.3 individuals per hectare), *Pinanga javana*, *Arenga pinnata*, and *C. asperrimus* each has 1.1 individuals per hectare. Regarding the length of the stem, less than 5 % of individuals from certain species of rattan have 10 to 20 m. This evidence indicates that people may still frequently harvest those particular species.

The sugar palm or locally known as *kawung* (*Arenga pinnata*) has been regarded as the most multi purpose tree species (MTPS). In Kasepuhan Ciptagelar, *A. pinnata* is mainly harvested for its *ijuk* or *injuk* (black fibers originated from disintegrated leafsheath, Fig. 2). The *ijuk* is used for roof (Figs. 3 & 4), ropes, and brooms.

The other uses of *kawung* include the usage of leaflets are for wrapping durian fruits. The half longitudinal opened stems are used for traditional water pipes. The wood is used for broom handles, hoe or small planks. Colourless exudate or liquid harvested from male inflorescences is the source for alcoholic beverage (locally known as *tuak*) and vinegar. The cabbage and young endosperms are edible. The process of preparing sugar palm observed in this current study is in accordance with Harada *et al.* (2005).

People in Kasepuhan Ciptagelar also use some species of rattans as raw materials for traditional 30cm by 25cm by 10 cm hanging bag known as the *kempak* or *konyen* or also known as *kaneron*. The main raw materials for the bag are harvested from splitting the cane of *Hoe seel* (*D. melanochaetes*) or *C. heteroideus*, *C. rhomboideus*, *D. rubra*. The process of preparing the *kempak* observed in this recent study is in accordance with Harada *et al.* (2005, Figs. 5 - 8). The price of one *kaneron* is ranging from IDR 20,000 to **IDR 30,000**.

The other uses of the rattans canes are as rope for building materials, floor mats for rice storage, and handicrafts. The cane harvested for rope are from the stem of *C. heteroideus*, *C. rhomboideus*, and *D. rubra*. For floor mats from the cane of *D. rubra*. The cane from this species is used for local inferior furniture as well. An infructescence of *Plectocomia elongata* is used for decoration (Fig. 9) in a *saren tahun*, a local celebration equals to the American thanksgiving.

DISCUSSION

Prior to this current study, the diversity, distribution, and density of the rattans in the GHSNP was conducted by Mogege (see Harada *et al.* 2005) and from 14 localities studied 15 species of rattans were found. This current study conducted in Kasepuhan Ciptagelar contributes 10 species of palms (Table 3, column 8).

The ethnobotanical data from Cibedug, Leuwijamang, and Ciptarasa (700- 1,400 m altitude) adds two rattan species (*C. polystachys* and *K. laciniosa*) to the previous checklist by Mogege (2002). Prior to this study *C. polystachys* is known only in swampy lowland secondary forests of Sumatra and in western part of Java was only in a small remnant of swampy beach forest in the Sukawayana Nature Reserved in Pelabuhan Ratu (see Dransfield 1979). Thus, the result of this present study extends the species distribution in Java.

The vernacular name for *C. polystachys* is *rotan gelang* and this refers to its leafsheath, which is covered by some encircling united spine bases. In pairs, these bases are interlocking each other to form a gallery. The gallery is commonly occupied by ants.

The taxonomical identity of *Korthalsia laciniosa* is still uncertain, thus needs further study. The species may belong to *K. grandis* of the Malay Peninsula and *K. teysmanii* of Sumatra and Java (Dransfield 1979). The vernacular name for this species is *hoe ceker kidang*. The vernacular name refers to the shape of the leaflet, which resembles the footprint of a duck.

The more familiar species *K. junghuhnii* may also belong to the same species as previously mentioned. The ethnobotanical data from Inner Baduy contributes 3 rattans species: *C. javensis*, *D. melanochaetes*, and *D. rubra* (Column 3). The Kasepuhan Cisungsang contributes 5 species: *C. javensis*, *C. heteroideus*, *C. ornatus*, *D. melanochaetes*, and *D. rubra* (Wardah, 2005; Column 16). The Cikidang region contributes 8 species: *D. rubra*, *P. elongata*, *K. junghuhnii*, *C. javensis*, *C. heteroideus*, *C. melanoloma*, *C. rhomboideus*, and *C. burckianus* (Column 17). *Calamus burckianus* is a new information on the species distribution in Java. Outside

the park, *C. burckianus* occurs in the lowland of Cipatujah TasikMalaya, West Java. The species is also found in Central and East Java to Bali. In Bali, women use a coconut grater which is made from a portion of four or five its spiny petioles (Dransfield, 1976).

The uses of rattans in Kasepuhan Cisungsang, Cikidang region, and in Inner Baduy are in general the same as have been previously reported by Harada *et al.* (2005) except for the preparation the split canes of *Calamus javensis* for bracelets, rings and the Inner Baduy traditional cloth (Figs. 10& 11), which was not reported by Harada *et al.*.

The young opened leaves of *Hoe pelah* (*D. rubra*) are used as a raw material for traditional cloth. Prior to woven process, threads should be prepared. First the rachis of the 1.5 m opened young leaf are thinly cut lengthwise, then soaked in water for one night until the colour of the cut rachis turned from green to white. Then they are lifted and dried in sun.

The cut rachis then becoming white fine threads, which can be spin, coloured, woven, and sold as souvenirs. The price of one cloth is ranging from IDR 200,000 to 300,000. Unfortunately, the traditional cloth is now rarely prepared as the ordinary cloth is easily purchased in the market in much cheaper price. The price of other handicrafts are as follows: hand fan is IDR 2,500 each, *nyiru* is IDR 5,000 each; *matawali* is IDR 5,000 each; *small boboko* and *salang* each is IDR 7,500 each; *tampir* or big *nyiru*, *aseupan used*, and *kuluwung* each is IDR 10,000 each.

CONCLUSION

The palms in Kasepuhan Ciptagelar consists of 15 species, covering five species of tree palms and ten species of climbing palms (rattans). The tree palms are *Pinanga coronata*, *P. javana*, *Nenga pumila*, *Caryota mitis*, and *Arenga pinnata*. The rattans are *Calamus javensis*, *C. heteroideus*, *C. ciliaris*, *C. rhomboideus*,

Table 3. The rattan distribution in GHSNP based on the results of this current study.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	19
No.	Botanical name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	F
01	<i>C. javensis</i>	u	u	u	u	u	u	u		u	u	u	u	u	u	u	u	u	16
02	<i>P. elongata</i>		u	u	u	u	u	u	u	u	u	u	u	u	u	u	u	u	16
03	<i>C. heteroideus</i>		u	u	u	u	u	u		u	u	u	u	u	u	u	u	u	15
04	<i>D. melanocheae</i>	u	u	u	u	u	u	u		u	u	u	u		u	u	u	u	15
05	<i>D. rubra</i>	u	u			u	u	u							u	u	u	u	09
06	<i>K. junghuhnii</i>		u	u	u	u	u									u	u	u	08
07	<i>C. rhomboideus</i>		u				u					u		u	u	u	u	u	07
08	<i>D. oblonga</i>		u	u		u	u							u		u	u	u	07
09	<i>C. melanoloma</i>		u						u	u						u	u	u	06
10	<i>D. hystrix</i>		u	u	u	u								u	u			u	06
11	<i>C. ornatus</i>		u			u		u						u		u	u	u	06
12	<i>C. ciliaris</i>		u	u		u	u									u	u	u	06
13	<i>C. asperimus</i>		u				u	u								u	u	u	05
14	<i>C. polystachys</i>																	u	01
15	<i>K. laciniosa</i>																	u	01
16	<i>C. burckianus</i>															u			01
		3	13	8	6	10	10	7	2	5	4	4	5	3	9	10	12	15	

NOTE: Column 2, Botanical name: C = *Calamus*, D = *Daemonorops*, K = *Korthalsia*, P = *Plectocomia*, D. melanoche. = *D. melanochaetes*, *Korthalsia laciniosa*. *Calamus polystachys*, and *C. burckianus* are recorded from the ethnobotanical observation. Column 3 - 19 are the observed sites, bracket after the site is the elevation : 1 = Baduy Dalam (450 - 750 m), 2 = Pameungpeuk (850-1,210 m), 3 = Cangkuang A (1,000 - 1,100 m), 4 = Cangkuang B (1,000 - 1,050 m), 5 = Cileungsi (900 m), 6 = Kasepuhan Ciptagelar (800 - 1,400 m), 7 = Gunung Kencana (850 - 1,210 m), 8 = Gunung Botol (1,700 - 1,750 m), 9 = Cikudapaeh - Citalahap (1,130 - 1,150 m), 10 = Pasir Baut (1,130 - 1,1340 m), 11 = Cikopo - Ciangsana (1,030 - 1,040 m), 12 = Citalahap - Cikaniki (1,100 m), 13 = Cikaniki (1,100 m), 14 = Kasepuhan Cisungsang (700 - 720 m and 1,050 - 1,200 m), 15 = Cikidang (1,100 - 1,400 m), 16 = Gunung Pangkulahan (1,000 - 1,400 m), 17 = Cibedug (1,000 m), 18=Leuwijamang (1,000 m), and 17=Ciptarasa (1,000 - 1,000). F = Frequency.

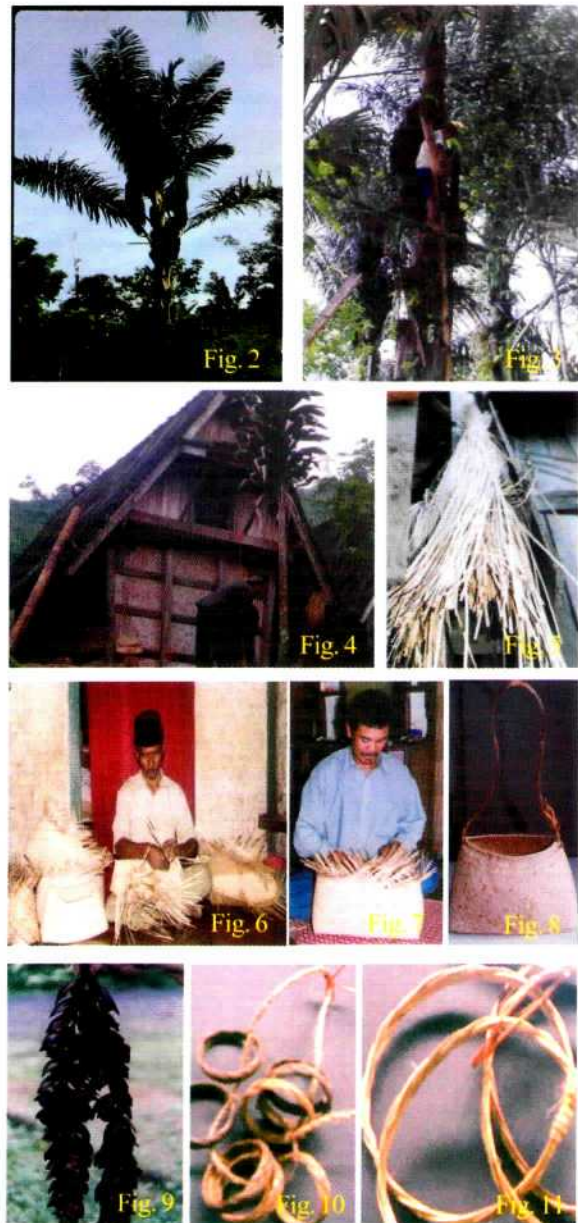
C. asperimus, *Daemonorops melanochaetes*, *D. oblonga*, *D. rubra*, *Plectocomia elongata*, and *Korthalsiajunghuhnii*. The species with obvious high density are *Pinanga coronata* (36.2 individual stems per hectare), *C. javensis* (25.0), *C. heteroideus* (24.4), and *D. melanochaetes* (23.3).

There are three a palm species added to the palm flora of the Gunung Halimun Salak National Park: *C. polystachys*, *C. burckianus*, and *A. lacinosus*.

The use of *Daemonorops rubra* as a raw materials for a traditional Inner Baduy cloth, the use of the split canes of *Calamus javensis* for bracelets and rings, and the use of the infructescences of *Plectocomia elongata* as decoration are new data.

LITERATURE CITED

- Anonym.** 1999. *Gunung Halimun National Park, Mesh Map*. Biodiversity Conservation Project. Bogor.
- Dransfield J.** 1974. *A short guide to rattans. Biotrop (Seameo Regional Centre For Tropical Biology)*. Bogor. Mimeographed.
- Dransfield J.** 1976. Palms in everyday life in West Indonesia. *Principes* 20, 39 - 47.
- Dransfield, J.** 1979. A Manual of the Rattans of the Malay Peninsula. *Forest Department Record Number 29*. Kuala Lumpur. Ministry of Primary Industries.
- Harada K, JP Mogeia and M Rahayu.** 2005. Diversity, Conservation and local knowledge of rattans and sugar palm in Gunung Halimun National Park, Indonesia. *PALMS* 40(1), 25 - 35.
- Kalima T.** 1996. Flora Rotan Pulau Jawa serta Kerapatan dan Persebaran Populasi Rotan di Tiga Wilayah Taman Nasional Gunung Halimun Jawa Barat. *Tesis S-2*. Jurusan Biologi FMIPA Universitas Indonesia, Depok.
- Miura K.** 2004. A challenge for a model national park management Gunung Halimun Salak Management Project. *Berita Biologi* 7(1), 1-6.
- Mogeia JP.** 2002. Rotan di Taman Nasional Gunung Halimun dan prospek budidayanya di Desa Cisungsang Lebak Banten. *Berita Biologi* 6(1), 33 - 47.
- Steenis CGGJ van.** 1950. The technique of plant collection and preservation in the tropics. *Flora Malesiana* 1(1), xlv - lxxix.
- Suzuki E, M Yoneda, H Simbolon; Z Fanani, T. Nishimura and M. kimura.** 1998. Monitoring of vegetation and changes on permanent plots in Gunung Halimun National Park. *Research and Conservation of Biodiversity in Indonesia* 1(1 V), 60-81. Bogor.
- Wardah.** 2003. Pemanfaatan keanekaragaman sumber daya tumbuhan oleh masyarakat Baduy Dalam di sekitar Gunung Kendeng Selatan, Kabupaten Lebak, Banten Selatan. *Berita Biologi* 6(6), 755-765.
- Wardah.** 2005. Pemanfaatan tumbuhan pada masyarakat Kasepuhan Desa Cisungsang di kawasan Taman Nasional Gunung Halimun Kabupaten Lebak Banten. *Berita Biologi* 7(6), 323-332.



List of figure:

2. A close up of tree *Arenga pinnata*
3. A close up of a sugarpalm tree *Arenga pinnata* to show the ijuk
4. Traditional roof is made from ijuk, the black fibers tattered leaf sheath of the sugarpalm *Arenga pinnata*
- 5-8. Process in making hanging bag *kaneron*, known as *kempak* or *konyen* as well
9. The infructescence of *Plectocomia elongata* is used as a decoration
- 10-11. Bracelets and rings are made mainly from the split cane of *Calamus javensis*