

(update: Aug.2012)

**CURRICULUM VITAE**

Name : Min Thein

Date of birth : 31st May 1945

Sex : Male

Parents : U Nyi Pu (deceased) & Daw Hnin Yin

Place of Birth : Mandalay, Myanmar

National Reg.No : 9/mayama (ng) 020190 ;

Passport No.  
Myanmar : A212440., M299209 .

Marital status : Married, Daw Phyu Phyu Thant, 1967.

Children : Daw Nu Nu Win, 1974 and U Ye Min Aung, 1977.

Status : Chairman, June Pharmaceutical Ltd.  
General Manager (retd), Myanmar Spirulina Factory, Sagaing and  
Professor (part time), Botany, University of Mandalay;

Address : Mailing: June Pharmaceutical Ltd.,No.168, Mahabandoola st., Corner of  
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Degrees : B.Sc. Hons(Botany) First class A, Mandalay 1966; Ph.D, Adelaide  
1973.

Fellowship : Alexander von Humboldt Research Fellow 1981-82 (14 months);  
1998(6 months); 2009(3 months); Humboldt ID: 1018662.



**Job Positions:**

- 1967-1973 Demonstrator, Botany Department, Mandalay University, Myanmar.
- 1973-1987 Demonstrator, Assistant Lecturer, Lecturer, Marine Science Department, Moulmein Univeristy, Myanmar.
- 1987-2008 General Manager, Myanmar Spirulina Project and Factory, Ministry of Industry (1), Myanmar.
- 2000- Present Professor (part time), Botany Department, Mandalay University, Myanmar.
- 2008- Present Senior Scientist Technician, Myanmar Spirulina Factory.
- 2010- Present Director, June Pharmaceutical Ltd., Myanmar.

**Study places and tours:**

- 1950-1961 S't Peters High School, Mandalay, Myanmar.
- 1961-1962 Rangoon Arts and Science University, Inter A
- 1962-1966 Mandalay Arts and Science University, Inter B - B.Sc. Hons.  
University student scholarship holder 1961-1966
- 1968-73 University of Adelaide, Australia: Ph.D candidate, Marine Aigae. (Colombo Plan.)
- 1981-82 Research Fellow of Alexander von Humboldt Research Foundation (AvH), Germany. Biologische Anstalt Helgoland : Marine Aigae
- 1983 UNDP Study tour on seaweed culture and uses in Japan ( 2 months).
- 1987 UNDP/UNIDO Study tour on Spirulina production and uses, in The Netherlands, Hawaii , Mexico.
- 1993 Symposium on Spirulina microalgae, Monaco.
- 1996 Study tour on Spirulina production and use, Belgium
- 1998 Research Fellow of Alexander von Humboldt Research Foundation, Germany. 2<sup>nd</sup> Renewed Research Stay (6months) at IGV GmbH , Institut fur Getreide Verarbeitung, Potsdam- Reh Brucke.
- 1999 8th International Conference on Applied Algology, Italy
- 2000 4<sup>th</sup> European Workshop on Microalgae Biotechnology, Potsdam. Reh-Brucke, Germany.

- 2003 5th European Workshop on Microalgae Biotechnology, Potsdam. Reh-Brucke, Germany.
- 2005 6th European Workshop on Microalgae Biotechnology, Potsdam. Reh-Brucke, Germany.
- 2006 Green Week Expo 2006 Berlin, Germany.
- 2007 7<sup>th</sup> European Workshop on Microalgae Biotechnology, Potsdam, Germany.
- 2008 2<sup>nd</sup> Asian Humboldt Foundation Colloquia, Changmai, Thailand.
- 2009 Research Fellow of Alexander von Humboldt Research Foundation, Germany. 3<sup>rd</sup> Renewed Research Stay (3 months) at IG V GmbH, Potsdam. Reh Brucke, Germany.
- 2010 8<sup>th</sup> European Workshop on Microalgae Biotechnology, Potsdam, Germany.
- 2011 5<sup>th</sup> International Algae Conference, Berlin, Germany.
- 2012 9th European Workshop on Microalgae Biotechnology, Potsdam, Germany.
- 2012 8<sup>th</sup> Asia-Pacific Conference on Algae Biotechnology (APCAB), Adelaide, Australia.

### Resume

- I. Min Thein read the first research paper "Algae of Mandalay Moat" at 1966 Burma Research Congress, Yangon as a final year B.Sc.Honours student.
2. He was appointed as a demonstrator at Botany Department, Mandalay University on 10th March 1967.
3. He won a Colombo Plan Scholarship Award and went to study in Australia from 1968 to 1973, leading to a Ph.D degree.
4. He was awarded a Ph.D from the University of Adelaide in 1973.
5. His Ph.D thesis on seaweeds, " Studies on Rhabdoniaceae, Solieriaceae and Rhodophyllidaceae (Gigartinales) South Australia" was published in the Australian Journal of Botany in 1974 .
6. Min Thein returned to Myanmar in 1973, and was transferred to Moulmein College to become a founding member of Marine Biology Department. As a Demonstrator , Assistant Lecturer and Lecturer, he taught Marine Botany and did research on marine algae basic research, production and use. During his research, he identified the occurrence of Porphyra in Myanmar, an edible red alga well known as 'nori' in Japan.

7. He won Alexander von Humboldt Research Fellow Award from Germany in 1981. As a post doctoral AvH research fellow , he worked with Dr. K. Luning at Biologische Anstalt Helgoland. He studied the response of marine alga *Spermatochnus paradoxus* to photoperiod. He found out that the alga could produce reproductive spores under short day conditions.
8. He visited Professor Dr. Carl Soeder in Julich Research Center in 1982. The Professor told him about the production and use of algae especially about Spirulina which is a microscopic blue green alga traditionally used as a food supplement in Africa and Mexico. and rediscovered by international scientists for use as a nutritional supplement. This was the beginning of the story of Spirulina in Myanmar. It is also the becoming of Min Thein as the pioneer scientist in R&D of Spirulina production and use as a supplement for human health, animal health and soil health in Myanmar.

### **Pioneer scientist of Myanmar Spirulina.**

9. On his return to Myanmar, Min Thein thoroughly studied the book "Algae Biomass, production and use", edited by Soeder. The chapters on Spirulina were most interesting.
10. He went to Japan in 1983 on a UNDP study tour on Seaweed production and use in Japan , starting from Hokkaido all the way down to Kagoshima for 2 months. During the tour, he gained important experience in the cultivation and processing of edible seaweeds both at cottage level and industrial scale. This experience contributed significantly in the coming R&D of Spirulina production and use in Myanmar.
- 11 . While reading the Algae Biomass several times, he observed the beautiful photograph of Twin Taung crater lake printed on Panyoma 1983 scenic calender. In the book, Spirulina lakes are said to be associated with volcanic areas. Since the lake water was totally green, indicating the presence of algae, he asked his parent's tea customers in Monywa about the lake. He was informed that there are a lot of algae scums in the lake especially during hot summer.
12. So, in April 1984, he went to the crater lake and saw personally the abundant occurrence of Spirulina microalgae in the lake water. With great delight he reported the finding to Dr.Maung Di, Rector of Rangoon University, Dr.Mg Di, who later became Dy.Minister of Education made plans for further studies on Spirulina with Dr. Min Thein as the key person.
13. Research and Development of Spirulina in Twin Taung lake was carried out from 1984 to1987 and involved the following acitvities:
  - 13.1 Visits of Marine Biology students and staff from Moulmein University to the crater lake for field studies amounting to more than 1000 man day.
  - 13.2 M.Sc. research students working on Spirulina, specializing in seasonal occurrence and enviromental factors of the lake, harvesting and processing of Spirulina from the lake, laboratory culture of Spirulina and nutritional composition of Spirulina.
  - 13.3 Sampie laboratory testing of Myanmar Spirulina in Japan, Australia, USA and the Netherlands.

- 13.3 Formation of Spirulina study group consisting of representative from various ministries.
- 13.4 UNDP/ UNIDO BUR/ 85/ 018, a two months study tour on Spirulina to The Netherlands, Hawaii and Mexico.
- 13.5 Transfer of Spirulina biotechnology (Lake environment studies, laboratory studies, harvesting and sun drying methods of Spirulina biomass, nutritional composition analysis results, toxicity tests, and tablet making etc) from Ministry of Education to Ministry of Industry (1) at the end of 1987.
14. Min Thein was transferred along with the Spirulina project, from Ministry of Education to Ministry of Industry (1) in 1987, to lead the development of laboratory scale to industrial scale production as the Project Director.
15. Pilot scale production of Spirulina began in 11th January 1988 at Twin Taung Crater Lake in Budalin Township with a temporary staff of Marine Biology graduates numbering about 30 persons.
16. First year harvest of Spirulina in 1988 was a little more than 2 tons but from 2006, the capacity of Spirulina biomass production has exceeded more than 200 dry metric tons per annum.
17. Production of Spirulina as nutritional supplement tablets began in January 1989. "Provimin" is the trade name given for the tablets meaning Spirulina is rich in protein, vitamin and minerals essential for good maintenance of human health. Post harvesting processing for tablet production was done in Myanma Pharmaceutical Factory, Yangon (MPF) up to 2003.
18. Myanmar Spirulina Factory was separately opened on 6th June 2003 at a 300 acre site in Ye Khar, Sagaing. Tablet production and quality assurance is now carried out in this new factory so as to avoid contamination to and with other drugs and excessive moisture in Yangon. In the current budget year, Provimin production has reached up to 0.2 million bottles (100nos of 500mg tablets, 50 gm net weight) per month. It is now widely accepted as a good natural nutritional supplement in Myanmar health food supplement market.
19. Since the project began in 1988, Min Thein has made relentless efforts to produce new Spirulina products which now totals 12 numbers. Examples are:
  - 19.1 Health Food such as Provimin tablets 1989, Biomin 2000 and Biomin -C caplets 2007.
  - 19.2 Functional foods such as Spirulina cracker 1990, Spirulina noodles 1993, Spirulina toffee 1994, Spirulina Aloe vera cordial 2001 and Spirulina beer formulation 2002.
  - 19.3 Cosmetics such as Min Wun Taung Spirulina Thanakha 1992, Spirulina shampoo 1998, Spirulina soap 1999.

- 19.4 New products under development are Spirulina with Anti Viral properties, Spirulina for Aquaculture use, Spirulina for Agriculture use and Spirulina for Animal Husbandary use.
20. Current year sales value of Myanmar Spirulina Factory is about Kyat 1.9 billion per annum. This include export earnings of US\$ 502456 and EURO 122357 from South Korea, Germany and some other countries.
21. A long term technical co operation was achieved with IGV GmbH, Institut fur Getreideverarbeitung, Germany. Dr. Min Thein was awarded a second AvH research fellow award for 6 months in 1998. Dr. Otto Pulz, the leading researcher and producer of microalgae in Germany agreed to be the host. In 2000, 8 senior staff have been sent to IGV ,on an agreed project, for training course on quality assurance system of Spirulina. Professor Dr. Dr. Otto Pulz from IGV has visited MSF more than 30 times since 1997. During his trips, he transferred new technologies and development of Spirulina production and use and exchanged information with Myanmar counterparts. IGV is also the distribution partner of Myanmar Spirulina in EU countries. Dr. Min Thein has also attended from 4<sup>th</sup> to 7<sup>th</sup> European Workshop of Microalgae Biotechnology held at IGV. A 3<sup>rd</sup> renewed research stay for 3 months at IGV GmbH was awarded for 3 months by Humboldt Foundation (AvH) in 2009.
22. Myanmar Spirulina Factory had been certified with a GMP certificate from Malaysian Ministry of Health, GMP Unit, in 02.07.2007.

#### **R&D of other resources.**

23. Apart from his basic duties and interests on **Spirulina**, Dr. Min Thein has also done research work in the following areas
- 23.1 **Artemisia plant** : Growing and maintenance of Artemisia plant strains under controlled photoperiod conditions. Artemesia is a Chinese medicinal herb, currently in use for producing anti malarial drug Artemesinin, Artemether and Artesunate. R&D of maintaining the high yield strain under vegetative conditions by controlling the light period has been developed by Min Thein in 2004. A total of 400 acres per year of Artemisia annua is planted at Pyin 00 Lwin . The leaves are transported to the Artemisinin extraction factory in Yangon resulting in an import substitute of this important anti malarial drug raw material.
- 23.2 **Aloe vera herb** : A plantation of 10 acres was established by Min Thein at the factory since 2000, and the gel was used for natural herbal preparations.
- 23.3 **Gum Arabica tree**: Gum Arabic, an excepiet used as a binding agent in tablet making process is imported from African countries. Senegal Acacia has been introduced by Forest Department in Myanmar, especially in dry zone areas. Since 2003, Min Thein has been involved in developing the method of extraction and refining of the Gum from Senegal Acacia trees in Myin Mu township. A pilot scale

production has been achieved and the gum is found to be suitable for tableting process in pharmaceutical industries.

- 23.4 **Jatropha plants:** A total of 50 acres of Jatropha were grown as part of the national plan for biodiesel production. since 2006.

### **National and International Awards**

24. Min Thein, an educator and researcher turned enterpruener, was awarded with 3 National Medals for his achievements in science and industry.
- 24.1 1994. "Outstanding Award in Industry Sector, 2<sup>nd</sup> level."
- 24.2 2003. "Outstanding Award in Medical Science Sector, 2<sup>nd</sup> level."
- 24.3. 2004. "Outstanding Award in Industry Sector, 1<sup>st</sup> level."
25. Min Thein was also received a " Senior Lifetime Achievement Award in Microalgae Biotechnology" at the International Algae Congress, December 1, 2011, Berlin, Germany" , for his scientific and industrial innovations and the world wide promotion of microalgae.

### **Current Activities**

26. He is still actively involved in the activities of the ever expanding Myanmar Spirulina Factory, both to maintain sustainable production plan and to develop new Spirulina products as well as its applications. He is a director (technical advisor) with "Sagaing June Pharmaceutical and Foodstuff Industries" which is the sole partner in joint venture (JV) with the Ministry of Industry for further production and marketing of Myanmar Spirulina.
27. He is also acting as a part time Professor in Department of Botany, Mandalay University for teaching and supervising Ph.D. candidates in the fields of R&D necessary for production of natural raw materials in Myanmar..
- 28.. Min Thein is currently doing R&D of Spirulina Biofertilizer. He has supervised 17 Ph.D candidates who did research on Spirulina and especialy the effects of on various plants of commercial interest such as cereals, legumes, vegetable, cut flowers and oil crops.
29. Min Thein is also doing research on the use of Spirulina as a Bio Gas enhancer. Preliminary results showed that bio gas production is nearly doubled with the use of a small amount of Spirulina biomass.

### **Future Activities**

30. Min Thein is planning to introduce a hybrid of elephant grass into Myanmar for use in compost and mulch as well as animal feed.

31. If financial assistance is available, Min Thein would like to strengthen the Myanmar Microalgal Laboratory (which is available for use by researchers, especially Ph.D candidates) with the following research equipments:
- 31.1 CO2 Analyser (soil and atmosphere).
  - 31.2 Plant Canopy Analyser.
  - 31.3 Flow through Microscope.
  - 31.4 SEM Microscope.
  - 31.5 Water Analyser (portable) with data logger.
  - 31.6 PCR for DNA replication.
32. Current laboratory equipments in use include: basic microscopes, microbiology incubators, walk in algal culture room, UV-Visible Spectrophotometer, HPLC, Gas Chromatography, Atomic Absorption Spectrophotometer, glasswares and chemicals etc.

### Publications ( in part)

33. Min Thein 1974. " Studies on Rhabdoniaceae, Solieriaceae and Rhodophyllidaceae (Gigartinales) South Australia" Australian Journal of Botany.
- Min Thein. 1987. Laboratory examination of *Spirulina* sample from Burma and a study of *Spirulina* production and use. *UNIDO/UNDP/BUR 85-018 report*: 119.
- Min Thein. 1993. Production of *Spirulina* in Myanmar. *In: (F. Doumengue, H. Durand-Chastel and A. Toulemont, eds) Spiruline algue de vie*. Musée Océanographique. Bulletin de l'Institut Océanographique. Numéro spécial 12, Monaco. pp. 175-178.
- Min Thein 2012. *Spirulina World Food* by Robert Henrikson. Myanmar Translation. 187pp. June Publ., Myanmar.
- Min Thein et al 2012. "Spirulina production: From natural resources to human welfare." in Posten and Walter. edi. *Microalgae Biotechnology: Integration and Economy*. DeGruyter. to be published.

### Ph.D thesis supervision.

34. Aye Mya Nyein. 2012. Effect of *Spirulina* on growth, yield and nutritive value of *Phaseolus vulgaris* L. (*Bosape*). Ph.D. Thesis. *Dept. of Botany, Mandalay University, Mandalay, Myanmar*.
- Khaing Khaing. 2012. Effect of *Spirulina* on growth, yield and nutritive value of *Phaseolus lunatus* L. (*Penigya*). Ph.D. Thesis. *Dept. of Botany, Mandalay University, Mandalay, Myanmar*.
- Khin Lay Nandar Aung. 2011. Effect of *Spirulina* on the germination, growth, yield and yield component character of *Vigna radiata* (L.) *Wilezek* (*Green Gram*). Ph.D. Thesis. *Dept. of Botany, Mandalay University, Mandalay, Myanmar*.
- Khin Pyone Lwin. 2007. Studies on physico -chemical properties of commercially produced *Spirulina platensis* in Myanmar. Ph.D. Thesis. *Dept. of Botany, Mandalay University, Mandalay, Myanmar*.



- Kyaw Kyaw San. 2009. Germination of Myanmar tea plants and cultivation of *Camellia sinensis* (L.) Kuntze by using *Spirulina* biofertilizer. Ph.D. Thesis. Dept. of Botany, Mandalay University, Mandalay, Myanmar.
- Kyaw Soe Naing. 2008. Effect of *Spirulina* on the germination and growth of three important oil crops. Ph.D. Thesis. Dept. of Botany, Mandalay University, Mandalay, Myanmar.
- Lwin Win. 2010. *Spirulina* in Biogas production. Ph.D. Thesis (to be submitted). Dept. of Botany, Mandalay University, Mandalay, Myanmar.
- Mar Lar. 2012. Effect of *Spirulina* on growth, yield and nutritive value of *Glycine max* (L.) Merrill (Peboke). Ph.D. Thesis. Dept. of Botany, Mandalay University, Mandalay, Myanmar.
- May Yu Khaing. 2007. Production and Quality Control of *Spirulina platensis* biomass culture on commercial scale in Myanmar. Ph.D. Thesis. Dept. of Botany, Mandalay University, Mandalay, Myanmar.
- San San Aye. 2012. Effect of *Spirulina* on growth, yield and nutritive value of *Lablab purpureus* (L.) Sweet (pegyi). Ph.D. Thesis. Dept. of Botany, Mandalay University, Mandalay, Myanmar.
- San Win. 2008. Effect of *Spirulina* on the germination and growth of tobacco. Ph.D. Thesis. Dept. of Botany, Mandalay University, Mandalay, Myanmar.
- Thet Naing Htwe. 2008. Effect of *Spirulina* on the germination and growth of chick pea, soybean and butter bean. Ph.D. Thesis. Dept. of Botany, Mandalay University, Mandalay, Myanmar.
- Tin Tin Maw. 2012. Effect of *Spirulina* on growth, yield and nutritive value of *Vigna mungo* (L.) Hepper (Mat-pe). Ph.D. Thesis. Dept. of Botany, Mandalay University, Mandalay, Myanmar.
- Toe Aung. 2007. Organic Farming of *Spirulina platensis* from Twyn Taung Lake in Myanmar. Ph.D. Thesis. Dept. of Botany, Mandalay University, Mandalay, Myanmar.
- Wai Wai Mar. 2007. Effect of *Spirulina* on the Growth and Yield of Onion, Tomato and Chili. Ph.D. Thesis. Dept. of Chemistry, Yangon University, Yangon, Myanmar.
- Win Mar. 2012. Effect of *Spirulina* on growth, yield and nutritive value of *Vigna unguiculata* (L.) Walp (Pelunphyu). Ph.D. Thesis. Dept. of Botany, Mandalay University, Mandalay, Myanmar.
- Win Naing Oo. 2008. Effect of *Spirulina* on the germination and growth of rice and wheat. Ph.D. Thesis. Dept. of Botany, Mandalay University, Mandalay, Myanmar.

## Appendix

35. 1 Award Certificate.
35. 2 *Spirulina* harvesting and processing from natural crater lakes.
35. 3 Effect of *Spirulina* biofertilizer on various crops.

Appendix 35.1



Appendix 35.2

Title : Spirulina Production from Crater Lakes in Myanmar

Poster : APCAB 2012, 9 - 12 July, Adelaide, South Australia.

Presented by Min Thein



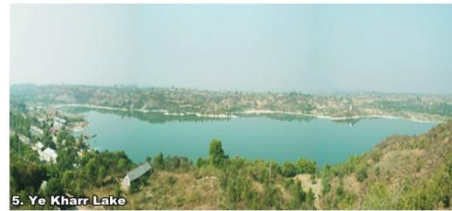
2. Twyn Taung Lake



3. Twyn Ma Lake



4. Taung Pyauk Lake



5. Ye Kharr Lake



6. Twyn Taung lake side enhancement ponds



7. Twyn Taung lake with floating Spirulina biomass covering 50% to 75% of water surface area around March.



8. Harvesting of biomass by boat.



9. Washing of biomass in horizontal revolving hollow cylinder with filter cloth.



10. Bags of Spirulina biomass for dewatering from yoghurt to dough stage.



11. Spreading of noodle filaments on plastic trays.



12. Spreading of plastic trays under the sun for drying.



Spirulina Shampoo



MinWunTaung Spirulina Medicated Thanakia (Cosmetic)



13. SAGAING JUNE Pharmaceutical & Foodstuff Industry Ltd



Spilova (Cordial)



Spirulina Beer



Spirulina Dry chip



PROVIMIN (100% Spirulina)



AVAMIN (Spirulina with extract)



BIOMIN-C (Spirulina & Honey)



Ar Yu (Myanmar TM)



O-Kleen (Spirulina Mouthwash Powder)



Spirulina Powder



www.junepharmaceuticals.com <minthein.algae@gmail.com>

Contact Address: JUNE PHARMACEUTICAL LTD. No. (168), Corner of 53rd & Mahabandoola Streets, Pazundaung Tsp., Yangon, Myanmar. ☎ 09-730 12000, 09-730 13000, 09-730 14000

Appendix 35.3



## 6<sup>th</sup> European Workshop on "Microalgal Biotechnology"

at IGV GmbH Nuthetal Germany. 23<sup>th</sup>-25<sup>th</sup>, May, 2005.

Title: Effect of Spirulina on seedlings of some crops in tropical Myanmar.

Author: Min Thein<sup>1</sup>, Otto Pulz<sup>2</sup>, et al<sup>3</sup>

Abstract: Spirulina promotes the growth of seedlings.

### Cereal crops:



Wheat

Rice

Rice

Rice

### Oil crops:



Ground nut

Sesame

Sunflower

Chick pea

Soya bean

### Leguminous crops:

### Vegetable crops:



Chili

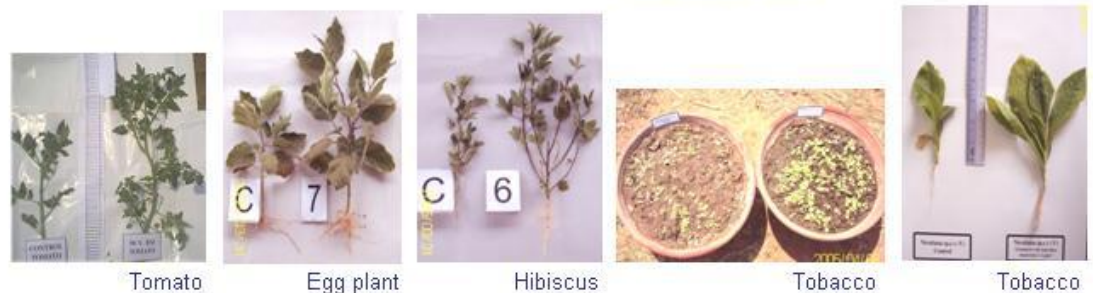
Carrot

Chinese kale

Cabbage

Papaya

### Industrial crops:



Tomato

Egg plant

Hibiscus

Tobacco

Tobacco

1. Myanmar Spirulina Factory, Ministry of Industry (1), Myanmar. <minthein.algae@mptmail.net.mm>
2. IGV GmbH, Nuthetal, Germany.
3. Nyo Sein<sup>1</sup>, Win Naing Oo<sup>4</sup>, Kyaw Soe Naing<sup>4</sup>, San Win<sup>4</sup>, Thet Naing Htwe<sup>4</sup>, Wai Wai Mar<sup>6</sup>.
4. Dept. of botany, University of Mandalay. 5. Dept. of Chemistry, Dagon University, Yangon, Myanmar.

(end. 17.08.2012)