

Desmids from Tasek Bera, West Malaysia

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Summary

Desmids represent a main algal component in the acid waters of the Tasek Bera. Their occurrence is generally discussed in relation to neighbouring regions. It is observed that there is a close affinity between the desmid floras of Tasek Bera and Sumatra. The over one hundred and fifty species, varieties and forms reported in this paper provide useful data for the longterm studies on primary productivity, general biology, and ecosystem analysis of the lake currently being pursued by the Malaysia-Japan IBP team.

Regarding the freshwater algae of tropical Asia, especially Indonesia, Singapore, Malaysia, Burma, Bengal, Madras, Ceylon, Madagascar and Australia many papers were published by JOSHUA¹, MÖBIUS^{2,3}, TURNER⁴, SCHMIDLE^{5,6}, WEST and WEST⁷⁻¹⁰, GUTWINSKI¹¹, BERNARD^{12,13}, KRIEGER¹⁴, SKUJA^{15,16}, SCOTT and PRESCOTT¹⁷⁻²², BEHRE²³, HIRANO^{24,25}, MIZUNO and MORI²⁶. A few papers have been published dealing with the desmids of Peninsular Malaysia from some localities such as Kuala Lumpur (BISWAS²⁷), Malacca, Tasek Bera and Singapore (PROWSE^{28,29}), Taiping Lakes (PROWSE and RATNASABAPATHY³⁰) and Gunong Gerai (RATNASABAPATHY³¹).

The collections of freshwater algae on which the present study is based were made during the Joint Malaysia-Japan Project of Scientific Investigation into Freshwater Lakes of Malaysia 1970-1973 and the Botany Honours Expedition, School of Biological Sciences, University of Malaya, July 27-August 1, 1970.

Duplicates of our collections are deposited both in the School of Biological Sciences, University of Malaya, Malaysia and in the Department of Biology, Faculty of Science, Kobe University, Japan.

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Tasek Bera

In Malaysia there are many 'black waters' represented by the Tasek Bera, one of the sources of the River Pahang. The Tasek Bera comprises a series of marshes separated by many small swamps, but interconnected by narrow rivulets which have fast flowing currents. The pH values of their waters range from 4.7 to 5.3, the water temperature 23.8 to 26.9 C at running water, 23.4 to 33.4 C at still water. The shallow parts and edges of the lake are covered with rush, *Lepironia articulata* association. One can find some aquatic plants such as *Utricularia* spp., *Hydrilla* sp., *Nymphoides indica* and *Pandanus helicopus* in still water, *Utricularia* sp., *Cryptocoryne griffithii*, *Scirpus confervoides* and *Pandanus helicopus* in running water.

Desmids from Tasek Bera

Amongst the various algal taxa, the Desmidiaceae, Bacillariophyceae and Cyanophyceae are especially conspicuous in the collection. The Desmidiaceae alone is represented by 168 species, varieties and forms. The great abundance and diversity of desmids is striking and possibly nowhere else in Malaysia would one find such a rich assemblage. Some of the desmids are known to occur only in this lake and nowhere else; such species for example are *Triploceras splendens* PROWSE, *Micrasterias foliacea* BAIL. var. *spinosa* PROWSE, *M. alata* WALL. f. *tumida* PROWSE and *Xanthidium superbum* ELFV. var. *centricornis* PROWSE. The desmid flora of the Tasek Bera has a close affinity to that of Indonesia especially Sumatra. No less than 134 species and varieties, that is over 89% of Tasek Bera desmids occur in Sumatra alone. The genus *Staurastrum* reported to be the dominant taxon in Indonesia by SCOTT and PRESCOTT²²) is also dominant in Tasek Bera. In general, our results indicate that the Tasek Bera belongs to the broad geographical area designated as the Indo-Malayan-North Australian region by KRIEGER¹⁴). Some species extend into North Australia. Some extend to Thailand and some even to Cambodia. A few species are found also in Ceylon, India, Burma, Japan and elsewhere.

The list of Desmids from Tasek Bera

Mesotaeniaceae	Gonatozygaceae
<i>Cylindrocystis brebissonii</i> MENEGH.	<i>Gonatozygon brebissonii</i> DE BARY
<i>Netrium digitus</i> (EHRB.) ITZIGS. et ROTHE.	<i>G. monotaenium</i> DE BARY

Desmidiaceae

- Penium cylindrus* (EHRB.) BRÉB.
P. silvae-nigrae RABANUS
P. spirostriolatiforme WEST et WEST
Closterium abruptum W. WEST var.
angustissimum SCHM.
C. acerosum (SCHRANK) EHRB.
C. biclavatum BÖRGES.
C. cuspidatum BAIL.
C. gracile BRÉB.
C. infractum MESSIK.
C. kuetzingii BRÉB.
C. libellula FOCKE.
C. libellula var. *elongatum* (KRIEG.)
 SCOTT et PRESC.
C. libellula var. *interruptum* (W. et
 W.) DONAT.
C. navicula (BRÉB.) LÜTKEM. var.
crassum (W. et W.) GRÖNBL.
C. setaceum EHRB.
C. striolatum EHRB.
Pleurotaenium baculoides
 (ROY et BISS.) PLAYF.
P. coronatum (BRÉB.) RBH. var.
nodulosum (BRÉB.) W. WEST
P. ehrenbergii (BRÉB.) DE BARY var.
undulatum SCHAARSCHM.
P. kayei (ARCH.) RBH.
P. minutum (RALFS) DELP.
P. minutum var. *crassum* (W. WEST)
 KRIEG. f.
P. nodosum (BAIL.) LUND. var.
gutwinskii KRIEG.
P. ovatum NORDST.
P. ovatum var. *inermius* MÖBIUS
P. subcoronulatum (TURN.) WEST et
 WEST f.
P. trabecula (EHRB.) NÄG.
P. tridentulum (WOLLE) W. WEST
P. tridentulum var. *gracile* KÖRSTER
P. undatum SCOTT et PRESC.
P. verrucosum (BAIL.) LUND. var.
validum SCOTT et GRÖNBL.
- Pleurotaenium verrucosum* var.
bulbosum KRIEG.
Triploceras gracile BAIL. f.
T. gracile f. *curvatum* SCOTT et
 PRESC.
T. gracile var. *undulatum* SCOTT et
 PRESC.
T. splendens PROWSE
Tetmemorus brebissonii (MENEH.)
 RALFS var. *tenuissimus* MÖBIUS
T. laevis (KÜTZ.) RALFS
Euastrum acanthophorum TURN. f.
minus SCOTT et PRESC.
E. ansatum EHRB.
E. ansatum var. *dideltiforme* DUCCELL.
E. gnathophorum WEST et WEST
E. gnathophorum var. *bulbosum*
 SCOTT et PRESC.
E. longicolle NORDST.
E. longicolle var. *capitatum* W. et W.
 f. *minus* SCOTT et PRESC.
E. moebii (BORGE) SCOTT et PRESC.
 var. *tetrachastriiforme* W. et W.
E. rostratum RALFS var. *bioculatum*
 SCOTT et PRESC.
E. sinuosum LENORM. var. *reductum*
 WEST et WEST
Ichthyocercus longispinus (BORGE)
 KRIEG.
Ichthyodontum sachlanii SCOTT et
 PRESC. var. *parorthium* SCOTT et
 PRESC.
Micrasterias alata WALL.
M. alata WALL. f. *tumida* PROWSE
M. anomala TURN.
M. anomala var. *kalimantana* SCOTT
 et PRESC.
M. anomala var. *sumatrana* SOCTT
 et PRESC.
M. apiculata (EHRB.) MENEH. var.
lacerata TURN.
M. ceratofera JOSHUA.
M. foliacea BAIL.
M. foliacea var. *quadrinflata* SCOTT

- et PRESC.
- Micrasterias foliacea* var. *spinosa*
PROWSE
- M. lux* JOSUA
- M. mahabuleshwariensis* HOBBS. var.
chauiodon SCOTT et PRESC.
- M. pinnatifida* (KÜTZ.) RALFS.
- M. pinnatifida* (KÜTZ.) RALFS f.
- M. quadridentata* (NORDST.) GRÖNBL.
f. *indonesiensis* SCOTT et PRESC.
- M. radians* TURN.
- M. thomasiana* ARCH. var. *evoluta*
KRIEG.
- M. thomasiana* var. *notata* (NORDST.)
GRÖNBL.
- M. torreyi* BAIL. var. *doveri* (BISWAS)
KRIEG.
- M. torreyi* var. *crameri* (BERN.)
KRIEG.
- M. torreyi* var. *curvata* KRIEG. f.
- Cosmarium askenasyi* SCHM.
- C. askenasyi* f. *latum* SCOTT et
PRESC.
- C. binerve* LUND. var. *subangulatum*
SCOTT et PRESC.
- C. contractum* KIRCHN. var.
pachydermum SCOTT et PRESC.
- C. decoratum* W. et W. var.
dentiferum WEST et WEST.
- C. denticulatum* BORGE var.
rotundatum BORGE f.
- C. globosum* (BULNH.) var. *wollei*
WEST et WEST f.
- C. lagerheimianum* (TURN.) SCOTT et
PRESC.
- C. nudum* (TURN.) GUTW.
- C. obsoletum* (HANTZ.)
REINSCH var. *sitovens* GUTW.
- C. quadrifarium* LUND.
- C. spinuliferum* WEST et WEST
- C. subexcavatum* WEST et WEST
- C. zonatum* LUND. var. *pyrifforme*
SCOTT et PRESC.
- Xanthidium acanthophorum* NORDST.
- var. *raciborskii* GUTW.
- Xanthidium antilopaeum* (BRÉB.)
KÜTZ. var. *laeve* SCHM. f.
longispinum SCOTT et PRESC.
- X. armatum* (BRÉB.) RBH.
- X. armatum* var. *anguligerum*
KRIEG. f.
- X. kalimantanum* SCOTT et PRESC.
- X. lepidum* WEST et WEST.
- X. superbum* ELFV. var. *centricornis*
PROWSE
- Arthrodesmus arcuatus* JOSH. var.
minus SCOTT et PRESC.
- A. arcuatus* var. *incrassatus* SCOTT et
PRESC.
- A. convergens* EHRENB.
- A. curvatus* TURN var. *incrassatus*
SCOTT et PRESC.
- A. gibberulus* JOSH.
- A. octocornis* EHRENB.
- A. sachlanii* SCOTT et PRESC.
- A. spechtii* SCOTT et PRESC.
- A. subvalidus* GRÖNBL.
- A. sumatranus* SCOTT et PRESC.
- Staurostrum arthrodesmiforme*
BEHRE
- S. cerastes* LUND. var. *coronatum*
KRIEG.
- S. connatum* (LUND.) ROY et BISS.
- S. corniculatum* LUND. var. *variabile*
NORDST.
- S. curvatum* W. WEST
- S. cuspidatum* BRÉB. f.
- S. cuspidatum* var. *divergens* NORDST.
- S. exporrectum* SCOTT et PRESC.
- S. freemanni* W. et W.
- S. feemanni* var. *triquetrum* WEST et
WEST
- S. limnetium* SCHM. var. *burmense*
WEST et WEST
- S. megacanthum* LUND. var. *orientale*
PRESC.

Staurastrum modestum BEHRE

S. octodontum SKUJA

S. orbiculare RALFS var. *denticulatum*
NORDST.

S. punctulatum BRÉB.

S. saltans JOSH. var. *polycharax*
SCOTT et PRESC.

S. saltans var. *sumatranum* SCOTT
et PRESC.

S. sexangulare LUND.

S. sexangulare var. *attenuatum* TURN.

S. sexangulare var. *subglabrum* WEST
et WEST

S. smithii (G. M. SMITH) TEILING

S. stauroton SCOTT et PRESC.

S. subauriculatum W. et W. var.
truncatum WEST et WEST

S. subgracillimum WEST et WEST

S. sublaevispinum WEST et WEST

S. subsaltans W. et W. var.
indonesianum SCOTT et PRESC.

S. tetracerum RALFS.

S. thienemanii KRIEG. f. *triradiatum*
SCOTT et PRESC.

S. tohopekaligense WOLLE f. *minus*
(TURN.) SCOTT et PRESC.

S. trissacanthum SCOTT et PRESC.
var. *dissacanthum* SCOTT et PRESC.

S. wildmanii GUTW.

S. wildmanii var. *majus* (W. et W.)
SCOTT et PRESC.

S. zahlbruckneri LÜTKEM. var.
mamillatum WEST et WEST

Sphaeroszoma granulatatum ROY et
BISS.

Onychonema laeve NORDST. var.

micracanthum NORDST.

Spondylosium nitens (WALL.) ARCH.
var. *triangulare* TURN.

f. *javanicum* GUTW.

S. moniforme LUND.

S. planum (WOLLE) WEST et WEST

Hyalotheca dissiliens (SMITH) BRÉB.

H. dissiliens var. *hians* WOLLE

H. inflata SCOTT et GRÖNBL.

H. mucosa (DILLW.) EHRB.

H. undulata NORDST. var.
perundulata GRÖNBL.

Groenbladia neglecta (RACIB.)
TEILING

G. neglecta var. *elongata* SCOTT et
GRÖNBL.

Desmidium aptogonum BRÉB. var.
tetragonum WEST et WEST

D. baileyi (RALFS) NORDST.

D. baileyi f. *longiprocessum* SCOTT et
PRESC.

D. baileyi f. *tetragonum* NORDST.

D. bengalicum TURN.

D. gravillei (KÜTZ.) DE BARY f.

D. graciliceps (NORDST.) LAGERH.

D. quadratum NORDST.

D. suboccidentale SCOTT et PRESC.

D. swartzii AG.

Bambusina brebissonii KÜTZ.

Phymatodocis irregularis SCHM.

P. irregularis var. *intermedia* GUTW.

P. nordstedtiana WOLLE

P. nordstedtiana var. *triangularis*
PROWSE

Streptonema trilobatum WALL.

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