Some new desmid taxa from Malaya and Singapore

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The Malay Peninsula and Singapore have generally acid waters and because of this the aquatic flora is rich in desmids. From the material now being studied I estimate that there are at least 200 taxa, some of which are undoubtedly new. A number differ in detail from forms already described and therefore need more critical study. The nine taxa being described here are however so distinctive that I feel it worthwhile publishing them in advance of a general paper.

All the specimens were examined under an Ortholux microscope, and the drawings, my own including the inking, were made with a camera lucida on the same microscope, corrected where necessary by direct observation. Thus any defects in the drawings are my own responsibility. The photographs were taken through the same microscope using the Orthomat automatic camera, and I am grateful to Mr. Mathew Chow Tian Pow of this Institute for developing and printing the film for me.

Pleurotaenium burmense (Josh) Krieg var. elegans, var. nov.

Varietas a planta typica differens multo brevior, tenuior, 7 undulationes aequabiles in quaque semicellula habens; poli plus minusve recti, a undulationes aeque lati vel paululum angustiores, circulo dentium 6 vel 7 acutissimorum praediti. Cellulae 260–280 μ long., undulationes 23–24 μ lat., depressiones et isthmus 17 μ lat., ad polos 22–24 μ lat.

This variety differs from the species in being much shorter and narrower, with 7 uniform undulations on each semicell. The poles are more or less straight, equal to or only slightly narrower than the width of the undulations, and are surrounded by 6–7 sharp teeth. Cells 260–280 μ long., undulations 23–24 μ wide, depressions and isthmus 17 μ wide and the poles 22–24 μ wide. Malacca river (2 specimens only), Tasek Bera (Negri Sembilan). Fig. 1 (a), Pl. 1.

This beautiful variety first appeared in a plankton net haul taken in 1956 when the Malacca river was in flood. Only two specimens were seen in this sample, identical in measurements, and one was immediately drawn using the camera lucida. The variety did not recur until 1967, this time in samples from Tasek Bera, a forest swamp lake 50 miles distant from the Malacca. A number of specimens have been examined, although they are not common, and there appears to be no difference in size and
Fig. 1. (a) Pleurotaenium burmense (Hosh) Krieg, var. elegans var. nov.
(b) Pleurotaenium spinosissimum sp. nov.
(c) Triploceras splendens, sp. nov.
(d) Microstriae alata Wall f. tumida f. nov.
(e) Microstriae americana (Hrb.) Ralfs var. macrodon var. nov.
proportions from the Malacca specimens. The figure and plate are from the Tasek Bera material. Scott & Prescott (1958) have described a variety from Arnheim Land, but this present variety differs in the extreme uniformity of the undulations, and the fact that the poles are more or less straight and hardly narrower than the undulations.

**Pleurotaenium spinosissimum**, sp. nov.

Cellula spinosissima, in quaque semicellula 9 undulationes aequalibes habens ad polos parum angustiores, rotundati. Spinae 4–5 \( \mu \) longae, seriales, ad undulationes juxta isthumum 6-seriebus, ad polos 3-seriebus, ad undulationes sub-polis 4-seriebus, et ad ceteros undulationes 5-seriebus. Cellula 286 \( \mu \) long., undulationes 26 \( \mu \) lat., depressiones et isthumus 22 \( \mu \) lat., ad polos 24 \( \mu \) lat.

Cell very spiny, with 9 uniform undulations on each semi-cell, the poles slightly narrower, rounded. Spines 4–5 \( \mu \) long, arranged in rows on the undulations, 6 rows next to the isthmus, 3 rows at the poles, 4 on the sub-polar undulations and 5 on all the others. Cell 286 \( \mu \) long, undulations 26 \( \mu \) wide, depressions and isthmus 22 \( \mu \) and poles 24 \( \mu \) wide. Malacca river (only 1 specimen).

Fig. 1 (b).

Only one specimen was found in a net haul taken during the flooding of the Malacca river in 1956, but it was so distinctive that it was immediately drawn with the aid of the camera lucida. Unfortunately no photographic equipment was available, so this description is based on notes taken at the time and on the drawing. Normally I would not erect a species on the basis of a single specimen, but it was so strikingly different from other species described that I feel justified in giving it specific status. Other species which occurred as 1 or 2 specimens in the same sample have since turned up again, particularly in the forest swamp lake Tasek Bera, so it is possible that this species will recur. The only previously described species with which *Pleurotaenium spinosissimum* can be compared is *Pleurotaenium spinulosum* first described by Wolle in 1884 and redescribed by Brunel (1949) as *P. spinulosum* (Wolle) Brunel together with its variety *madagascariensis* Brunel. Both differ markedly from this species in having fewer and less uniform undulations, and the spines finer and much more irregularly arranged. The regular rows of prominent spines is very characteristic of *Pleurotaenium spinosissimum*, as are the uniform undulations, and it is therefore worthy of specific rank.

**Triploceras splendens**, sp. nov.

Species crassa, in quaque semicellula 6–7 undulationes habens, spinas longos prominentes verticillatim ferens, spinea juxta isthumum paulo breviiora. Poli 3-partibus procurentibus divisi, unusquisque ferens unam spinam terminalem longam extrorsus curvam et 4 spinas breviiores binatim dispositas sursum curvas. Cellulae 250–300 \( \mu \) long., undulationes sine spinis 30–50 \( \mu \) lat., cum spinis 50–90 \( \mu \) lat., depressiones et isthumus 25–30 \( \mu \) lat.
A stout species, with 8 undulations on each semicell and bearing whorls of long prominent spines, those next to the isthmus being shorter. Each pole divided into three projecting parts, each of which bears a long terminal spine curving outwards, and four shorter spines arranged in pairs and curving upwards. Length 250–300 µ long, undulations without spines 30–50 µ wide, with spines 50–90 µ, depressions and isthmus 25–30 µ.

Tasek Bera Fig. 1 (c) Pl. 2.

This magnificent species has occurred only in the forest swamp lake Tasek Bera and nowhere else. It is much stouter than other species, and is clearly a member of the genus Triploceras by virtue of the division into three parts at the poles. Borge (1897) has described from Australia a plant which he called Docidium australianum, later transferred by Krieger (1937) to the genus Triploceras. Scott & Prescott (1958) rightly point out that it has rounded poles and have renamed it Pleurotaenium australianum. This species has occurred together with Triploceras splendid in the same samples and there is no possibility of confusing them. The species described here is clearly a Triploceras while the other species is clearly a Pleurotaenium.

**Micrasterias alata** Wall fa. **tumida**, fa. nov.

Forma a planta typica differens lobis subterminalibus tumescen-
tibus juxta lobum terminalem. 200–212 µ long., 175–185 µ lat.,
isthmus 25–30 µ lat.

This form differs from the species by a bulge at the base of the subterminal lobes next to the terminal lobe. 200–212 µ long, 175–185 µ wide, isthmus 25–30 µ wide.

Tasek Bera. Fig. 1 (d) Pl. 3.

Although this form occurred together with the typical species in the same samples it was much commoner and there were no intermediate forms. I therefore feel justified in separating it off as a definite form.

**Micrasterias foliacea** Bail. var **spinosa**, var. nov.

Varietas formis ceteris differens isthmio multo apertiore, spatia
inter lobos subterminales et lobos terminales latius hians. Juxta
isthmum et ad basim lobi terminali utrique dentes acutissimos
prominentes binatim ferens, dentes ad extremitatem loborum
acutissimi. Cellulae 72–75 µ long., 68–70 µ lat., isthmus 8 µ lat.

This variety differs from all other forms in the wide open
isthmus and the wide gap between the subterminal and terminal
lobes. Pairs of prominent sharp teeth are borne on either side
of the isthmus and on both sides of the base of the subterminal
lobe, with sharp teeth at the ends of the lobes. 72–75 µ long,
68–70 µ wide, isthmus 8 µ wide.

Tasek Bera Fig. 2 (a) Pl. 4.

This variety is unmistakeable, particularly for the wide isthmus,
large gap between the terminal and subterminal lobes, and
prominent teeth which are so thickened and often brown as to
Fig. 2. (a) *Micrasterias foliacea* Bill. var. *spinosa* var. nov.
(b, c) *Xanthidium superbum* Elfv. var. *centricornis* var. nov.
(d, e, f) *Streptopoma quadriangularis* sp. nov.
(g, h) *Phymatocaulis nordstediana* Wolle var. *triangularis* var. nov.
give the whole plant a spiny appearance. There are a number of varieties of *Micrasterias foliacea* which have been described, but none have such an open appearance or such prominent teeth. The variety has so far occurred nowhere else in Malaya, but appears to be common in Tasek Bera.

*Micrasterias americana* (Ehrbg.) Ralfs var. *macrodon*, var. nov.

Varietas a planta typica et formis ceteris differens, ad aperturas isthi, et juxta aperturas inter medi-lobos et lobos subterminales dentes curvos manifestos ferens, similiter ad extremitates loborum terminalium. Ad isthnum ferens duo paria tumorum super-positorum unusquisque in dentem terminans. 115 μ long., 108 μ lat., isthmos 21 μ lat.

This variety differs from the species and all other forms in bearing a row of prominent curved teeth either side of the isthmal and midlobar openings and along the end of the terminal lobe. At the isthmus are two pairs of over-lapping swellings, each ending in a tooth or spine. 115 μ long, 108 μ wide, isthmos 21 μ.

Malacca river (only two specimens.)

Fig. 1 (e).

Only two specimens were found in a net haul taken after floods in the Malacca river in 1956, and one of these was immediately drawn with the aid of the camera lucida and measured. With no photographic equipment available at the time it was not possible to photograph the specimens, and this description is taken from notes and the drawing. Although forms of *Micrasterias mahabuleshwarensis* Hobs. are quite common in Malaya this form is clearly quite different in shape and proportions, and comes close to *Micrasterias americana*. Accordingly I have placed it under the latter species, and since it has features distinct from any previously described form I feel justified in separating it off as a new variety. It is hoped that like other desmid forms found in the same sample it may eventually recur.

*Xanthidium superbum* Elv. var. *centricornis*, var. nov.

Varietas a planta typica differens spinas longas plus numerosas (utrinque 8 paria) ferens, ad isthnum duo tumores oppositos habens, uterque duo, raro 3-4, spinas longos ferens. In quae semicellula aream centralam inspissatum habens irregularum ochraceam maculatam. Cellulae sine spinis 85-100 μ long., cum spinis 125-140 μ long., sine spinis 55-60 μ lat., cum spinis 85-90 μ lat., isthmos 10 μ lat., tumor centralis sine spinis 10 μ lat., spineae 10 μ long.

This variety differs from the species in having more numerous long spines (8 pairs on each side), and bearing at the isthmus two opposite swellings each bearing a pair, rarely three or four, prominent spines. The central area of each semicell is thickened with irregular yellowish-red areas. Cells without spines 85-100 μ long, with spines 125-140 μ long, without spines 55-60 μ wide, with spines 85-90 μ wide, isthmos 10 μ wide, central swellings without spines 10 μ wide, spinae 10 μ long.
This particular variety of *Xanthium superbum* was fairly common in the Tasek Bera, but the type species has not yet been seen in Malaya.

**Phymatodocis nordstedtiana** Wolle var. **triangularis**, var. nov.

Varietas a planta typica differens a vertice visa triangularis, paries cellulae et vagina mucilagina ferruginei. Cellulae 40 μ long., 35 μ lat., isthmus 18 μ lat.

This variety differs from the species in the triangular end view, and the rusty iron coloured cell wall and mucilage sheath. 40 μ long, 35 μ wide, isthmus 18 μ wide.

**Streptonema quadrangularis**, sp. nov.


This species differs from *Streptonema trilobatum* in the end view always being quadrangular, in the longer intercalary mucilage processes, and the wider isthmal openings. Arms of semicells lightly curved in opposite directions. Cells 28–30 μ long, 60 μ wide, isthmus 17 μ wide, isthmal opening 10–12 μ wide, intercalary processes 10–12 μ long.

Malacca, Negri Sembilan, Singapore, Johore. Fig. 2 (d) (e) (f). Pl. 7.

*Streptonema trilobatum* occurs in Java, in Sumatra and Northern Australia, but has not been seen at all in Malaya and Singapore. On the other hand *Streptonema quadrangularis* is the only form which occurs here and does not appear to extend into Indonesia and Australia. Although taxonic status might be debatable, because of the restricted range and the distinguishing morphological characters I would prefer to regard it as a new species.
Bibliography


Also consulted was the comprehensive collection of illustrations of algae gathered by the late F. E. Fritsch and housed in the Freshwater Biological Association, Windermere but here available as I.D.C. microfiche 1–1133.

Numerous other published works on desmids were consulted, but as these proved to have no immediate relevance to the taxa described here they are not cited.

Acknowledgements

I wish to thank all those who have helped in collecting material — Dr. J. Richardson, George Tay Seng Hock and Lim Teck Jin. My thanks are also due to Mathew Chow Tian Pow for developing and printing the photographs, and to Mr. Hong Por Kang for numbering and lettering the drawings and plates. To Mr. Humfrey Ball I am grateful for his checking my Latin diagnoses. Finally to the Director of the Botanic Gardens, Singapore, I express my gratitude for permission to publish this paper in the Gardens’ Bulletin.
Plate 1. *Pleurotaenium burmense* (Joshi). Krieg. var. *elegans* var. nov. x 800.
Plate 2. *Triploceras splendens* sp. nov. x 340.
Plate 3. *Micrasterias alata* Wall. *fa. tumida* fa. nov. x 420.
Plate 4. *Microsterias foliacea* Bail. var. *spinosae* var. nov. x 400.
Plate 5. *Xanthidium superbium* Elfv. var. *centricornis* var. nov. x 850.
Plate 7. *Streptonema quadrangularis* sp. nov. x 450.