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Amscottia mira *(Grönblad) Grönblad (Desmidiaceae, Zygnematophyceae) recolectada 55 años después de su descripción original*

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Abstract: *Amscottia mira* (Grönblad) Grönblad (Desmidiaceae, Zygnematophyceae) was collected for the second time 55 years after its original description. The present material was collected from the Curicuriari River (sampling site 00º 12.454' S, 66º 47.678' W), a black water tributary on the right bank of the Negro River, Amazonas State, northern Brazil. Examined specimens totally agreed in their overall morphology with that of the original illustration and description of the species. The locality from which specimens were gathered is located at 49 m a.s.l. The river water temperature was 26.9º C, with high acidity (pH 3.7), somewhat low conductivity (24.37 μS cm^{-1}), good amount of dissolved oxygen (6.26 mg L^{-1}) and strong color (256.56 mg Pt^{-1}).

Key words: Asymmetrical desmid, Brazil, environmental conditions, rediscovery, South America

Resumen: *Amscottia mira* (Grönblad) Grönblad (Desmidiaceae, Zygnematophyceae) fue colectada por segunda vez 55 años después de su descripción original. El presente material fue colectado del río Curicuriari (localidad de muestreo 00º 12,454' S, 66º 47,678' W), un río de aguas negras tributario de la orilla derecha del río Negro, Estado Amazonas, norte de Brasil. Los especímenes examinados concordaron íntegramente en su morfología general con la ilustración y descripción original de la especie. La localidad en que los especímenes fueron colectados está ubicada a 49 m s.n.m. La temperatura del agua fue de 26,9º C, elevada acidez (pH 3,7), conductividad relativamente baja

(24,37 μS cm^{-1}), buena cantidad de oxígeno disuelto (6,26 mg L^{-1}) y fuerte color (256,56 mg Pt^{-1}).

Palabras clave: Brasil, condiciones ambientales, desmidiácea asimétrica, redescubrimiento, Sudamérica

1 Introduction

Amscottia, the first ever described bipolar asymmetric desmid genus, was proposed by Grönblad [2] initially as *Scottia*, based on material collected by Harald Sioli from a lake at the mouth of Igarapé Mentaí (2º 28' S, 55º 34' W), located about 50 km in a straight line from Santarém, in the Brazilian northern State of Pará. According to Grönblad [2], the lake water was brownish in color and had a pH of 4.5. Immediately, after realizing that his *Scottia* was a later homonym of *Scottia* R. Brown ex W. Aiton & W.T. Aiton [1] a Papilionaceae, Grönblad [3] proposed the new name *Amscottia* for this desmid, thus maintaining his tribute to Arthur Miller Scott, a North American desmidiologist. *Amscottia mira* (Grönblad) Grönblad (= *Scottia mira* Grönblad) was the only species of the genus for 31 years, after which Ling & Tyler [4] proposed a second one, *A. gulungulana* Ling & Tyler, on the basis of material gathered from the Magela Creek billabongs between Jabiru and the East Alligator River, on the Magela Creek floodplain, ca. 250 km east of Darwin, in the Northern Territory of Australia.

2 Methods

Amscottia mira was collected only once, but *A. gulungulana* was collected from Magela Creek, Mine Valley Billabong, Backflow Billabong, Gulungul Billabong and from a pool near Yirrkalla, all water bodies in the Australian Western Territory. Fifty-five years later, on August 4, 2008, one of us (DP) collected several specimens of *A. mira*. One single sample was then gathered with a 25 μm mesh plankton net from the Curicuriari river (sampling site 00º 12.454' S, 66º 47.678' W), a tributary of the right bank of the Negro River, municipality of São Gabriel da Cachoeira, Amazonas State, northern Brazil.

3 Results and discussion

Amscottia mira (Grönblad) Grönblad

Cells large, at the middle divided in two semicells by means of a widely open, deep constriction. Semicells not alike: the upper one with an apical corona of 8 or 9

teeth, the lower one with a rounded smooth apex (Fig. 1A-D, 2). Both semicells are somewhat obovate, with an inflated basis tapering towards the apices; they have a whorl of 6 processes just below the apex, which is strongly protruded in the upper semicell and widely rounded in the lower one. Another whorl of 10 processes is to be found in both semicells near the isthmus, inserted at the most inflated point. In the upper semicell, all processes are strongly curved upwards, but in the lower semicell they are also curved, but not too strongly and towards the upper semicell ("in the wrong direction"). All processes are hollow and furnished with a few acute spines on the outer margin at the region of their greatest curvature, and all of them end in three slightly divergent spines, of which the inner one is twice as long as the other two. Vertical view of semicells is circular, with 10 radiating processes at the outer margin which are denticulate at their ends; inside the margins 6 similar processes and in the central area there are 8 or 9 teeth arranged in a circle (Fig. 1F-I); the latter lacking in the vertical view of the lower semicell. Between the processes the cell wall is smooth. The shape of the chloroplasts was never observed as to their exact details, but it seems, according to Grönblad [2], that there are 5 or 6 axial longitudinal "laminae" or "bundles" from which pairs of fine extensions go into the processes of lower whorl, and single extensions into those of the upper whorl. The number of the pyrenoids is not known, but sometimes in vertical view one pyrenoid can be seen in each lamella, the lamellae being not connected at the central longitudinal cell axes.

Dimensions of the cell including both Grönblad's [2] and present specimens: length without processes (87)106-128 μm, maximum length with processes 143-189 μm, width without processes (28.9)38-57 μm, maximum width with processes 125.6-159 μm, isthmus 22-34 μm wide (Figs 1A-D, 2).

Present specimens were gathered from the Curicuriari River, a tributary of the right side margin of the Negro River, municipality of São Gabriel da Cachoeira, Amazonas State, northern Brazil, leg. *Domitila Pascoaloto* n. 04-VIII-2008 (INPA248640). These specimens are very much similar in their overall cell morphology to those from the original collection in the State of Pará. The only difference lies on the measurements, since the original specimens are a little smaller, a fact somewhat common since they are from different populations gathered from different localities.

It is very interesting to note that the cell morphology of the Pará specimens is identical to that of the Amazonas ones, demonstrating that the genus and species diagnostic features are very much stable, notwithstanding the sampling localities and their separation by ca. 1,600 km in a straight line.

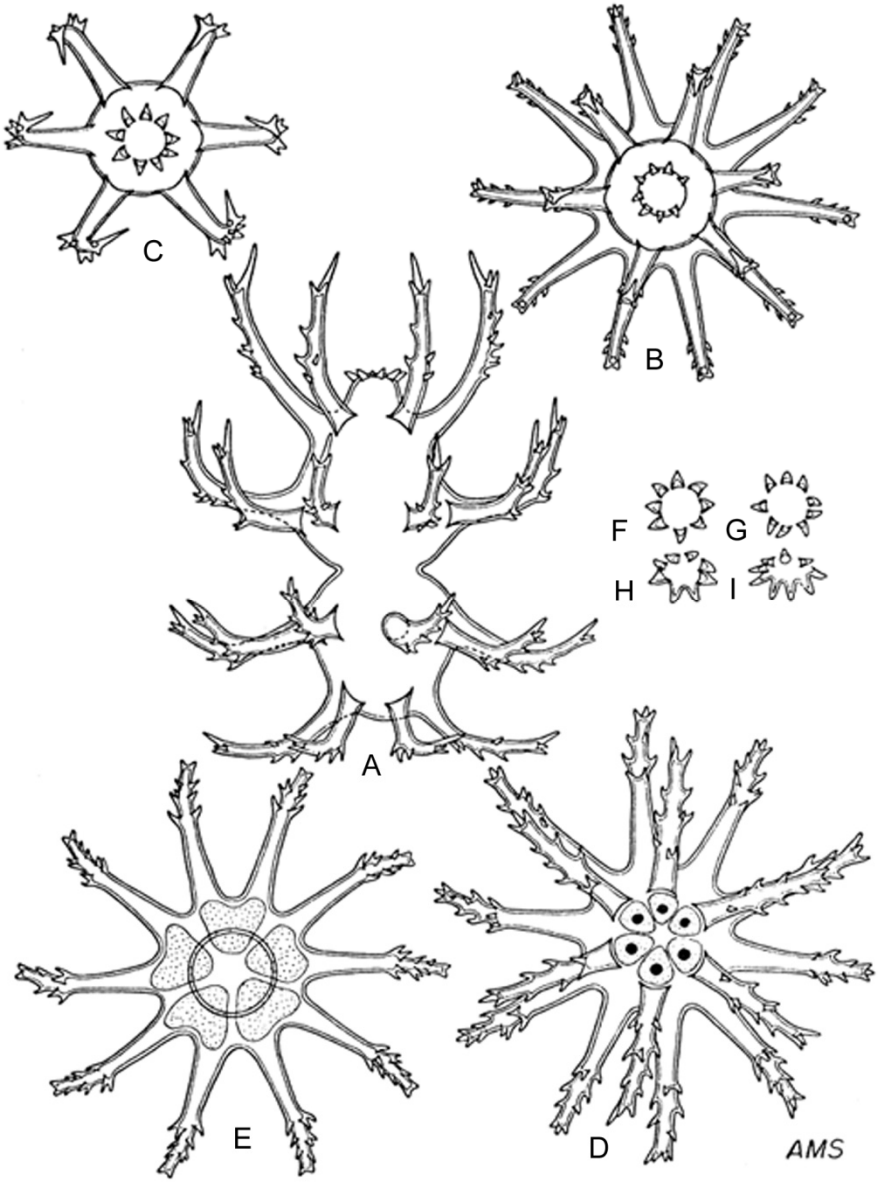

Figure 1: *Amscottia mira*. **A**. Front view. **B**. Vertical view of upper semicell. **C**. Vertical view of lower semicell. **D**. Basal view of lower semicell. **E**. Basal view of upper semicell. **F-I**. Vertical view of apical coronae, with 8 and 9 teeth. (original drawings by A.M. Scott in Grönblad [2]). Scale bar: 50 µm.

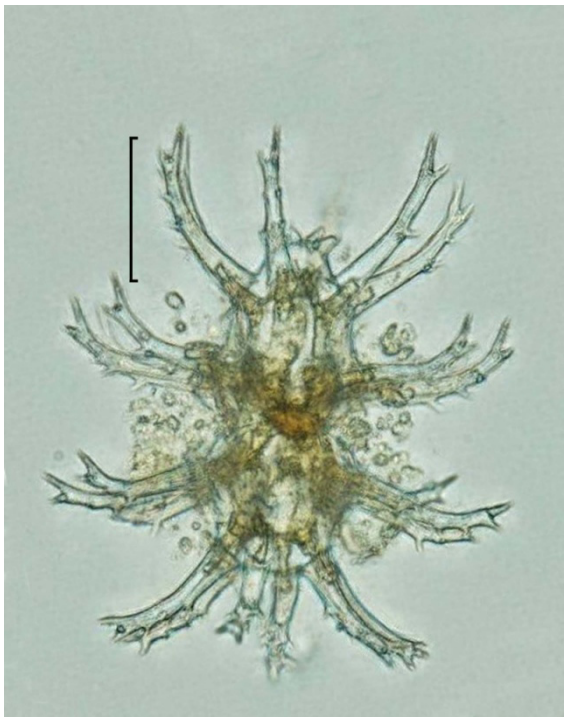

Figure 2: *Amscottia mira*, photomicrograph by Climéia C. Soares of a specimen from the Curicuriari River. Scale bar: 50 µm.

The place from which the Amazonas' specimens were collected is located 49 m a.s.l. and at about 1,600 km from the type locality. The water temperature at the moment of collection was 26.9º C, dissolved oxygen 6.26 mg L^{-1}, pH 3.7, conductivity 24.37 µS cm^{-1} and color 256.56 mg Pt^{-1}. The sample was gathered near the river margin, at a depth of 0.98 m. In other words, the species was collected living in a very acid environment, with somewhat low conductivity, fair amount of dissolved oxygen and dark color. The only reference about the type-locality includes the very acid pH (4.5) and brownish color of the water (no value given in Grönblad [2]). It is also interesting to note that both samples were collected from a very narrow latitude strip (ca. 2º south of the Equator), but about 11º longitudinally apart from one another.

Regarding *A. gulungulana*, the Mine Valley Billabong is flooded and flushed, but it may dry up completely and Gulungul becomes very turbid, the water being not distrophic (color < 50 mg Pt L^{-1}) and the pH falling to 4.0 or less at the end of the dry season. The season range of the chemical conditions at the Mine Valley Billabong may be pH 3.5-5.5 and total phosphorus 100-400 µm L^{-1} [4]. However,

according to the same authors there was no ecological information collected for the Yirrkalla locality at that time other than the water not being dystrophic.

4 Conclusions

Amscottia mira was collected just once before this study and the cell morphology of the Pará specimens (original material) is identical to that of the Amazonas ones (present material), notwithstanding the sampling localities and their separation by ca. 1,600 km in a straight line. The only difference resided in their dimensions, the Amazonas material being a little smaller, but with some overlapping occurring between the Amazonas greatest specimens and the Pará smallest ones.

References

[1] Aiton W. & Aiton, W.T.1812. *Hortus Kewensis* 4: 268 (2nd edition).

[2] Grönblad, R. 1954a. *Taxonomical notes*. In: Grönblad, R. & Kallio, P. A new genus and a new species among desmids. Botaniska Notiser 1954: 167-171.

[3] Grönblad, R. 1954b. *Amscottia* Grönbl. – nom. nov. Botaniska Tidskrift 1954: 433.

[4] Ling, H.U. & Tyler, P.A. 1985. *Amscottia gulungulana* sp. nov. (Desmidiaceae) from Tropical Australia. British Phycological Journal 20: 335-339.