



## New Record of the Bottle Liverworts *Sphaerocarpos Donnellii* Aust. for Iraq and Middle East Countries

Basheer Ali Basheer Al-Ni'ma

Department of Biology, College of Sciences, Mosul University, Mosul, Iraq

Received: 5/4/2020

Accepted: 6/1/2021

### Abstract

The Order Sphaerocarpaceles of the bottle liverwort consists of five genera, among which *Sphaerocarpos* in turn consists of 8-9 species. The genus is nearly worldwide distributed, but disjunct, sporadic, and localized throughout the range in North America, South America, Europe, Africa, and Australia. According to the published checklist, only two species of *Sphaerocarpos* were recorded in the middle east countries. These are *S. texanus* and *S. michelii*, both were found in Turkey, while only the latter was found in Iraq. By the current study, an additional species, *S. donnellii*, will be added to the byroflora of the Middle East (south west Asia) region. A specimen of this species was found in Mosul city, Nineveh province, Iraq, grown on loamy soil in a house garden.

**Key words:** Bottle liverwort, Iraq, Middle East, Mosul, *Sphaerocarpos donnellii*

### تسجيل جديد للحزاز القنينة الكبدي *Sphaerocarpos donnellii* Aust.

#### للعراق ودول جنوب شرقي آسيا

بشير علي بشير النعمة

قسم علوم الحياة، كلية العلوم، جامعة الموصل

#### الخلاصة

تتألف رتبة حزازيات القنينة Sphaerocarpaceles، وهي من رتب الحزازيات الكبديّة، من خمسة أجناس من بينها جنس *Sphaerocarpos* والذي بدوره يتألف من 8-9 أنواع. ينتشر هذا الجنس في معظم أنحاء العالم لكن في مناطق منعزلة عن بعضها ومتفرقة ويتمركز وجوده في أمريكا الشمالية والجنوبية وأوروبا وأفريقيا وأستراليا. وفقا لقوائم الحزازيات المنشورة هناك نوعان فقط من الجنس *Sphaerocarpos* تم تسجيلهما في دول جنوب شرق آسيا وهما *S. texanus* و *S. michelii*. كلا النوعان وجدا في تركيا في حين أن النوع الثاني (*S. michelii*) وجد في العراق. وفي خلال العمل الحالي سوف يتم إضافة نوع جديد هو *S. donnellii* على الفلورا الحزازية لمنطقة الشرق الأوسط (جنوب غربي آسيا). وجدت عينات من هذا النوع في مدينة الموصل، محافظة نينوى- العراق نامية على تربة مزيجية في حديقة منزلية.

### INTRODUCTION

A worldwide revision of the genus *Sphaerocarpos* is over 100 years old [1]; other revision work focuses on individual geographic areas, including South Africa [2], North America [3-6], California [7], Europe [8, 9], and France [10]. No revisions have been made for large areas, including Australia, Asia, and South America [11].

\*Email: babasheer2003@yahoo.com

The published works about the byroflora of Iraq were started in 1870 with the appearance of Juratzka and Milde's paper [12], which included a few information about Iraq. Since that time and up to date, the following four checklists about the country have appeared [13-16]. The last revised list included a total of 209 species and their taxa, among which only 14 species belong to Division Marchantiophyta.

In the middle east (or south west Asian) countries, including, of course, the adjacent countries of Iraq (Jordan, Syria, Turkey, Iran, Kuwait, and Saudi Arabia), the genus *Sphaerocarpos* was represented by two species, i.e. *S. texanus* and *S. michelii*, which were found in Turkey only [14, 17], while in Iraq, the genus *Sphaerocarpos* was represented by *S. michelii* only, which was recorded by Al-Ni'ma [18].

#### **MATERIALS AND METHODS**

The specimen was collected in the 13<sup>th</sup> of February 2013 from a house garden located in Mosul city, North of Iraq, found growing on loamy soil under a citrus tree.

Examination was conducted using compound and stereo microscopes of the Olympus and Wild models, respectively. The photos were captured by a Huawei mobile camera, model Nova 5T.

#### **RESULTS AND DISCUSSION**

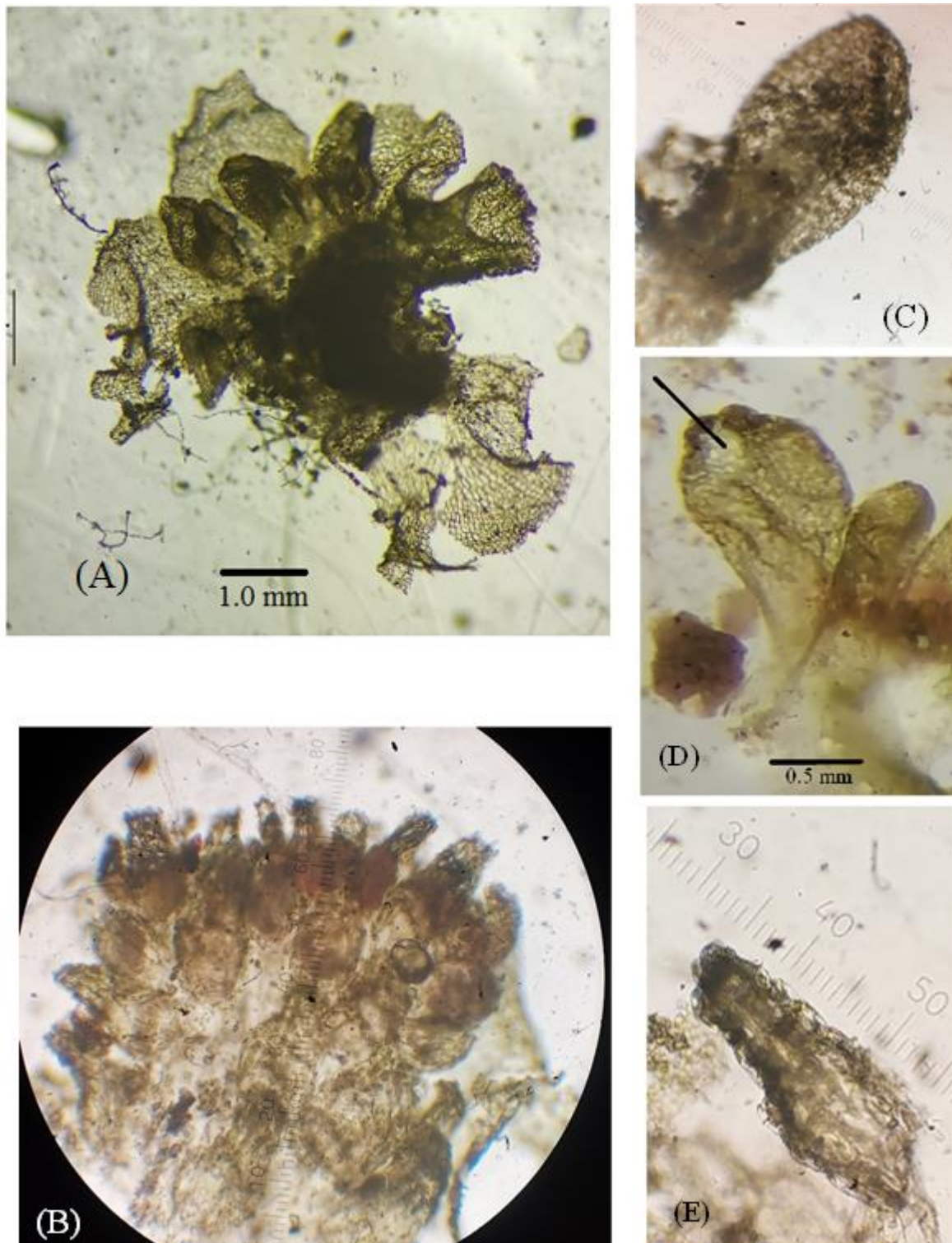
Identification of the specimen, depending on the key mentioned in Haynes (1910) [1], revealed that it is *Sphaerocarpos donnellii* Aust., which has one synonym, i.e. *Sphaerocarpos terrestris* Underwood & Cook.

According to the recent classification system of Stotler & Crandall-Stotler (2000) [19], the species belongs to Family Sphaerocarpaceae which in turn belongs to Order Sphaerocarpaceales, Class Marchantiopsida, Division Marchantiophyta.

#### **Description of the species**

The plant is minute in size; the maximum length of the female thallus approaches 1.0 mm, hardly seen by naked eye; the antheridial thallus is cuneate, smaller than the archegonial thallus, equal to almost one third of the female thallus; the antheridial involucre is flask shaped, sessile, 650 µm long, and 250 µm wide; the archegonial thallus is cuneate, with a sinuous margin; the archegonial involucre is ovoide-ellipsoide, sessile, truncate at apex, 1.7 mm long, and the diameter of its orifice is less than that of the involucre subjacent part Pl. (1). The Genus *Sphaerocarpos* consists of 8-9 species [5]. Members of this genus grown on soil in subtropical to temperate areas, North America, South America, Europe, Africa, and Australia (BFNA Web site) [20].

According to Frey and Kurschner [14], the species *S. donnellii* was not found and recorded yet in all Middle East regions including, of course, the six countries which are surrounding Iraq. Thus, the present work is considered the first record for the species in Iraq and Middle East (south west Asian) countries.



**Plate 1-** *Sphaerocarpos donnellii*, A: Archegonial thallus, B: Antheridial thallus, C: Female involucre, D: Orifice of the female involucre, E: Male involucre. Each single ruler graduation in B, C & E is equal to 25 micrometers.

#### REFERENCES

- [1] Haynes, C.C. "*Sphaerocarpos hians* sp. nov., With a Revision of the Genus and Illustrations of the Species". *Bulletin of the Torrey Botanical Club*, vol. 37, no. 5, pp. 215-230, 1910.
- [2] Proskauer J. "The Sphaerocarpales of South Africa". *The Journal of South African Botany*, vol. 21, pp. 63-75, pp. 1955.

- [3] Haynes, C. C. and Howe, M. A. "Sphaerocarpaceae". *North American Flora*, vol. 14, pp. 1-8, 1923.
- [4] Frye, T.C. and Clark, L. "Hepaticae of North America". University of Washington Publications in *Biology*, vol. 6, pp. 105-113, 1937.
- [5] Schuster, R.M. "The Hepaticae and Anthocerotae of North America". V. Chicago: *Field Museum of Natural History*, pp. 811–813, 1992.
- [6] Timme, S. L. Sphaerocarpaceae. Version 1. In: *Bryophyte Flora of North America*, provisional publication. Missouri Botanical Gardens, St. Louis. Available at: [science /BFNA /V3 SphaSphaerocarpaceae.htm](http://science.kew.org/bfna/V3/SphaSphaerocarpaceae.htm), 2003.
- [7] Howe, M.A. "The Hepaticae and Anthocerotes of California". *Memoirs of the Torrey Botanical Club*, vol. 7, pp. 64-70, 1899.
- [8] Reimers H. "Revision des europäischen Sphaerocarpus-Materials im Berliner Herbar". *Hedwigia*, vol.76, pp. 153-164, 1936.
- [9] Müller K. *Die Lebermoose Europas*. In: "Rabenhorst's Kryptogamenflora von Deutschland", Österreich und der Schweiz. 3. Auflage. Volume VI. Part 1. Leipzig, Akademische Verlagsgesellschaft Geest & Portig K.-G., Johnson Reprint Corporation (1971), New York, London, 1954.
- [10] Douin, R. "Les Sphaerocarpus français". *Revue Bryologique*, vol. 34, no. 6, pp. 105-112, 1907.
- [11] Forrest, Laura "Sphaerocarpos, Preview to a Monograph". a *Tag Posted By Laura Forrest* on September 9, 2016.
- [12] Juratizka, J. and Milde, J. "Beitrag zur Mossflora des Orients. Kleinasien, das Westliche Persien Und den Caucasus betreffend. Verhandlungen Zoologisch- Botanischen". Gesellschaft in Wien, vol. 20, pp. 589-602, 1870.
- [13] Frey, W. and Kurschner H. "The Bryological Literature of South West Asia". *Journal of Hattori Botanical Laboratory*, vol. 50, pp. 217-229, 1981.
- [14] Frey, W. and Kurschner, H. "Conspectus Bryophytorum Orientalum et Arabicorum". *Bryophytorum Bibliotheca*, Band, vol. 39, pp.181 Pages, 1991.
- [15] Al-Ni'ma, B.A. and Al-Khay'yat, Abdul Husain. "Check List of Iraqi Bryoflora" *Bulletin of Iraqi Natural History Museum*, vol. 9, no. 3, pp. 7-18, 2001.
- [16] Al-Ni'ma, B.A. "Bryophyte Group With a Special Chapter on Iraqi Bryophyta". Ibn Al-Atheer Publishing House, University of Mosul: 223 pp. (in Arabic), 2019.
- [17] Kürschner, H. and Erdağ, Adnan. "Bryophytes of Turkey: An Annotated List of the Species With Synonyms from the Recent Literature and An Annotated List of the Turkish Bryological Literature", *Turkish Journal of Botany*, vol. 29, pp. 95-154, 2005.
- [18] Al-Ni'ma, B.A. "New record of Liverworts from Mosul Iraq". *Journal of Education & Science*, vol. 20, pp. 36-44, 1994.
- [19] Stotler, R. E. and Crandall-Stotler. "A Revised Classification of the Anthocerotophyta and Checklist of the Hornworts of North America", North Mexico. *Bryologist*, vol. 108, pp. 16-26, 2005.
- [20] BFNA, Bryophyte Flora of North America. Sphaerocarpaceae. Provisional Publication, *Missouri Botanical Garden*: <http://www.mobot.org/plantscience/BFNA/bfnamenu.htm>.2017.