

EUPHORBIA MACULATA L. NEW RECORD SPECIES FOR IRAQI FLORA FROM THE FAMILY EUPHORBIACEAE IN IRAQ

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ABSTRACT

During the field trips in the gardens of the University of Baghdad at Al-Jadriya region and the gardens of the University of Al-Mustansiriya during the two growing seasons 2020-2021, a new species belonging to the family Euphorbiaceae, genus Euphorbia was observed and recognized *E. maculata* L. which did not recorded for the Iraqi flora, and it was collected from different regions and studied morphologically, the characteristics of the procumbent stems, and leaves which were distinguished for their green color, elongated shape, and the presence of red spots in the middle of the leaf. The study also dealt with the characteristics of the epidermis and the stomatal complexes, as the sunken stomata and being recessed and of diacytic, anomocytic and anisocytic types, as well as the epidermis were distinguished by the presence of glandular and non-glandular hairs. The research also dealt with the characteristics of the flower, fruit and seed, as well as the characteristics of the anthers and pollen grains. A number of samples for the species in the university herbarium in the College of Science, University of Baghdad, and the number was given (50472) and (50473).

Key words: Fruit, seed, red spot, sunken stomata



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Received: 22/8/2023, Accepted: 5/11/2023, Published: 28/02/2026

INTRODUCTION

Euphorbiaceae, is one of oldest as well as the largest plant families at all world, consisting of almost (300) genera with 8,000 - species (Webster, 1987). And is one from the families that have latex-producing (Lewinsohn, 1991). The genus *Euphorbia* generally called spurge which includes a large variety from plants with biological as well as medical- applications (Kemboi D *et al.*, 2020). These species were distributed at both temperate with tropical- regions (Pahlevani and Mozaffarian, 2011). The endemic species like *E. resinifera* at Morocco (Chakir *et al.*, 2016), *E. cubensis* and *E. helenae* and *E. munizi* and *E. podocarpifolia* at Cuba (Steinmann *et al.*, 2007) *E. polycaulis* in Iran (Nasr *et al.*, 2018b) *E. hainanensis* in China (Tian *et al.*, 2018) *E. fauriei*, *E. garanbiensis* at Korea as well as Taiwan (-Ki-Ryong, 2004), and so *E. boetica* at the Iberian peninsula (Narbona *et al.*, 2007). The genus *Euphorbia*, includes several species were distributed at both the temperate as well as at tropically zones (El-Ghazaly and Chaudhary, 1993). However,

numerous species were also presents in non-tropical areas like Africa and at Central and at South America (Liang *et al.*, 2014) species are distributed at India, particularly at North and also at West (Pascal *et al.*, 2017). The genus was represented at Taiwan with eight species (Lin and Hsieh, 1991). There were nearly 90 species as a rule centered at Iran with about 91 species at Turkey (21), with about 70 species found in China (Liang *et al.*, 2014). Furthermore, at Brazil, the genus was represented with near 64 species, and a degree from endemism of near 50% (31 species) (Steinmann *et al.*, 2007; Webster, 2014). This family was one of the largest genera within 31 the angiosperms (Horn *et al.*, 2012) In Iraq.

MATERIALS AND METHODS

Plant samples belong to the species under study were collected from the gardens of the University of Baghdad in Al-Jadriya, as well as from the gardens of the University of Al-Mustansiriya during the field trips for the 2021 and 2022 growing seasons. the species was observed in prostrate population among the weeds and another species like *E. serpens* L.

and *E.prostrata* L., the species was identified according to the characteristics of the family and genus , and its morphological characteristics and some anatomical characteristics were studied, the properties of epidermis depending on the method of (Al-Alaaq,2006), as well as study pollen grains in which we adopted the method of (Erdtman,1952)under a light and anatomical microscope, measurements and dimensions were recorded and pictures taken with camera type Sony 16 mega-pixel.

RESULTS AND DICUSSIONS

Table1,2 ,the species is distinguished by the extension of its stems on the ground(procumbent) , the result consistent with study of (Pascal *et al.*,2017), and the main stem branches into several side branches, which in turn branch into smaller branches as dense manner , plate No. (1,2).The total length of the stem is about (5-30) cm. extended in a creeping manner, colored in light green. The stem is connected from the bottom to a root that is tap root, white with small side branches, about a(2-5) cm long, The stems are covered with a distinct and dense layer of different hairs as glandular and a-glandular hairs plate No.(3,4,5,6). Leaves (0.75-1.25)cm. , are opposite, elongated, rounded at the top, and grooved at the margins and distinguished by their green color and the presence of a brown spot in the middle of the leaf, characteristic of the leaf that the name of the species came, its dimensions (0.75-1.25) mm. As for the auricles, they are ribbon or thread-shaped, translucent in color, with grooved edges It consists of 2-3 serrated parts(11) ,(plate 7).The species is monoecious (have female , male

flowers in the same plant),the flowers (0.1-0.25)mm. in axil of leaf(many), flowers are yellow stamen and hairy pistil (0.12-0.05)mm. which assembles in the form of a cuplike structure known as cyathia , the results Consistent with study of (Prenner and Rudall.2007), (plate8,9) .Fruit(0.9-1.5)mm, consists of three chambers and is covered with hairs (plate 10) ,These results are consistent with (Dorsey, 2013) as he proved that the fruits (0.9-1.5)mm. are basically fleshy, with explosive dehiscence3.Seed (0.7-1.15)X(0.9-1.5)mm. ,brown, elongated oval, with (6-8) grooves on its outer surface, this characteristic is very important in diagnosing this species, and seed characteristics can be relied upon for diagnosis (Sulaiman *et al.*, 2020)(plate11.) 2- As for the stomatal complexes are from the sunken stomata type, it became clear that there are three types of stomata: the anomocytic type, which consists of cells surrounding the stomata in irregularly form, The other type is the anisocytic type, which is in the form of three cells of varying size surrounding the stoma This is consistent with a study (Al-Dobaissi, 2016), The other type of stomatal complex is diacytic form, where two cells are perpendicular and there is stoma between them, (plate 12,13) 3- Pollen grains study : As for the pollen grains, the results of the study showed that they are spherical (27.5X25.5)μ.,The polar view(25.5)μ showed that the grain had three Colporate ,As for the equatorial view(27.5μ) , it shows the presence of three grooves extending from the upper pole towards the lower pole and that the surface patterning of the grain wall was finely reticulated(plate 14) (plate 15).

Table 1. shows the quantitative and qualitative morphological characteristics of the species *E.maculata*

Parts of plant	Quantitative characters	Qualitative Ch.
Root	(3-5)	White ,tap root ,branched
Stem	(5-30)	Prostrate, light green , densely branched
Leaf	(0.75-1.25)cm	Elongated, opposite, spotted in the middle
Inflorescence	-----	Cyathium
Flower	(0.1-0.25)mm	Many
Stamen	-----	Yellow
Pistil	(0.12-0.05)mm	Hairy,cup-like
Fruit	(0.9-1.5)mm.	Regma(schizocarpic capsule)
Seed	(0.7-1.15)X(0.9-1.5)mm.	Brown, elongated , oval,(6-8)grooves

Table 2. Quantitative and qualitative characteristics of the anatomical characters of the species

Part of plant	Quantitative characters	Qualitative Ch.
Glandular trichome	(0.012-0.15) μ	Multicellular, short hair
A glandular trichome	(0.13-0.1.5) μ	Multicellular long hair
Pollen grains		Spherical
Polar view	(25.5) μ	Three colpus withpore
equatorial view	(27.5) μ	Colporate
Stomatal complex	-----	Anisocytic type
		Diacytic type
		Anomocytic type

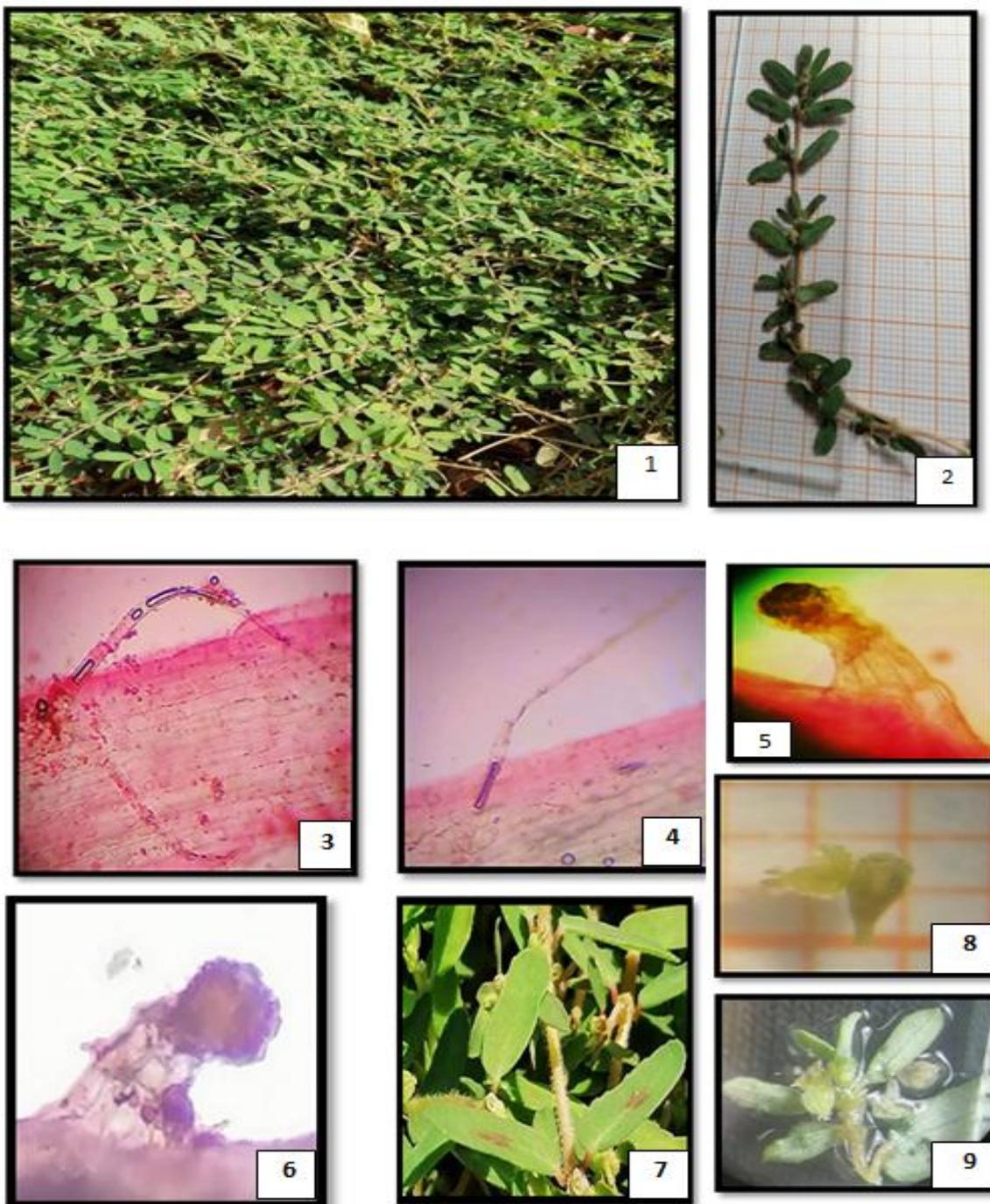


Fig 1. 1-Morphological view(plant in garden),2-whole plant , 3,4- multicellular and long trichome (350X),5,6- glandular multi-cellular trichome (450X),7-leaves,8-fruit,9-inflorescence

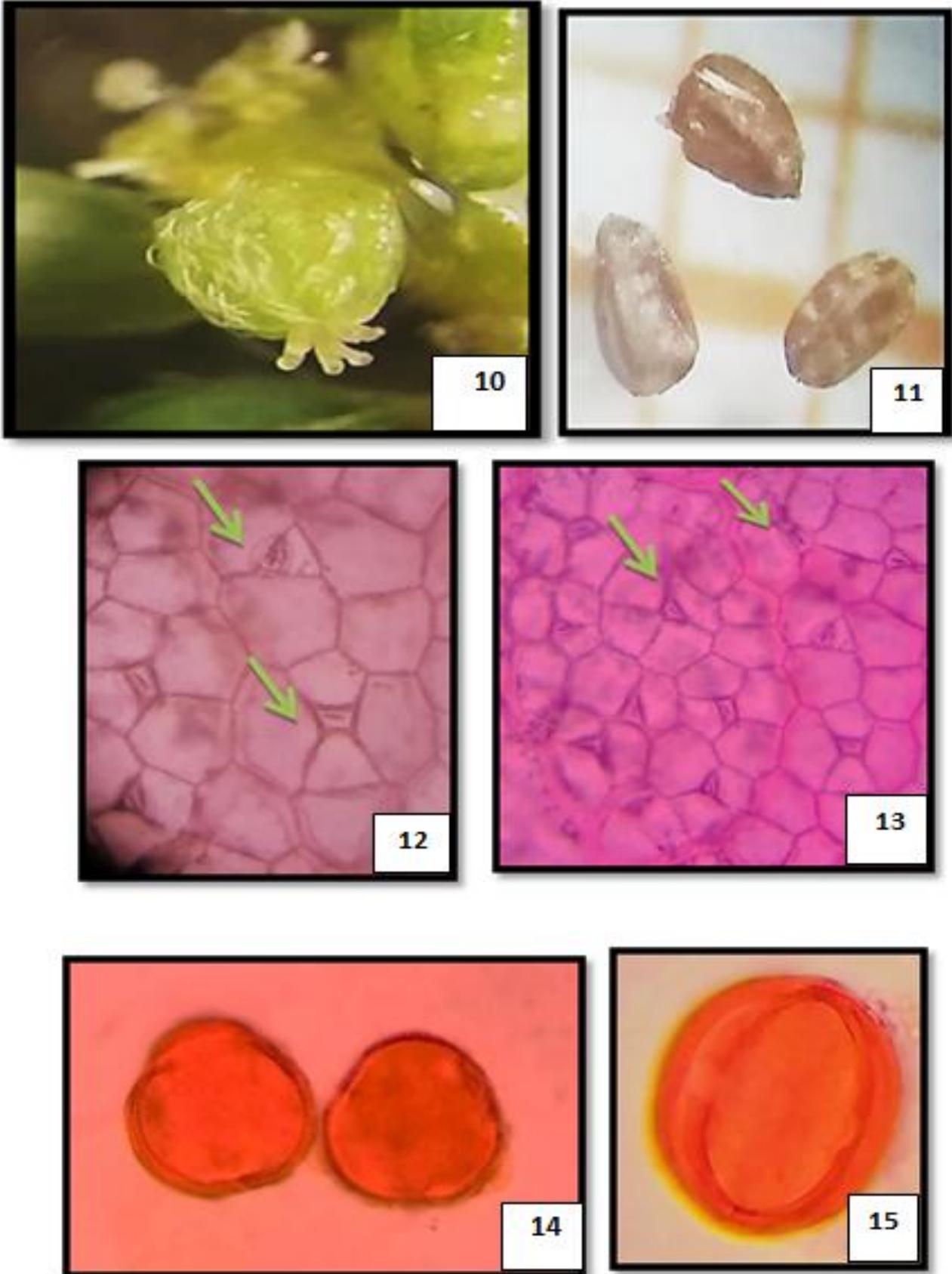


Fig.2 10-pistile , 11-seeds , 12- anomocytic type (250 x), 13- anisocytic type , paracytic type (300X) , 14-polar view pollen grain (350 X) , 15- Equilateral view pollen grain(350X)

CONCLUSION

This study confirms the presence of *Euphorbia maculata* L. as a newly recorded species in the Iraqi flora based on detailed field, morphological, and anatomical investigations. Distinctive vegetative, epidermal, floral, and pollen characteristics supported accurate taxonomic identification of the species. The findings highlight the importance of continued botanical surveys to update and enrich the floristic records of Iraq.

ACKNOWLEDGEMENT

The authors would like to express their sincere gratitude to the University of Baghdad and the University of Al-Mustansiriya for providing access to the study sites. Special thanks are extended to the staff of the Herbarium, College of Science, University of Baghdad, for their assistance in preserving and cataloging the plant specimens.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

DECLARATION OF FUND

The authors declare that they have not received a fund.

AUTHOR/S DECLARATION

We confirm that all Figures and Tables included in this manuscript are original and prepared by the authors. Any figures or images obtained from external sources have been used with the required permissions, which are included with the manuscript.

The authors confirm that the Ethical Approval Statement has been reviewed and signed.

Ethical Clearance and Animal Welfare: Not applicable, as this study involved plant specimens only and did not include animal or human subjects.

Funds: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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الفربيون الملطخ تسجيل نوع جديد للفلورا العراقية من عائلة ام الحليب في العراق

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المستخلص

خلال الجولات الحقلية في حدائق جامعة بغداد في منطقة الجادرية، وحدائق الجامعة المستنصرية لموسمي النمو 2020-2021 تمت ملاحظة نوع جديد يعود لعائلة ام الحليب وللجنس *Euphorbia* وهو النوع *E. maculata* L. لم يتم تسجيله للفلورا العراقية ، وتم جمعه من مناطق مختلفة ودراسته مظهرها حيث درست صفات السيقان والتي كانت منبطحة والاوراق التي تميزت بلونها الاخضر وشكلها المتطاوّل وبوجود بقعة حمراء اللون في وسط الورقة كما تناولت الدراسة صفات البشرة والمعقدات الثغرية اذ تميزت الثغور بكونها غائرة ومن الانواع المتعامد والشاذ وكذلك غير المتساوي، و تميزت البشرة بوجود الشعيرات الغدية واللاغدية ، كما تناول البحث صفات الزهرة والثمرة والبذرة فضلا عن صفات المتوك و حبات اللقاح ، وتم ايداع عدد من العينات للنوع في معشب الجامعة في كلية العلوم جامعة بغداد واعطيت الرقم 50472 و50473 .

الكلمات المفتاحية: ثمرة ، بذرة ، البقعة الحمراء ، ثغور غائرة