



SYSTEMATIC STUDY FOR THE NEW RECORD *CLEOME SCAPOSA* DC. (CLEOMACEAE) IN IRAQ

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Abstract

Cleome scaposa DC. is a new additional plant species to Cleomaceae family in Iraq, present in Wadi Amij (southeast of Rutba) of the western desert district (DWD). The species was collected in the spring season of 2018. The identification of the species was confirmed by using a taxonomic key in available references of some Flora, the Morphological description was done, and some distinguishing characters are given. Some Fruits, Seeds and pollen grains characters have been studied such as colors, shapes, sizes, and numbers. Some of the pictures and drawing for the Floral and vegetative parts were done, as well as a map of species distribution. Plant sample of species were deposited in National Herbarium of Iraq (BAG) with the numbers 59783, 59784 and 59785, in addition to Herbarium of Anbar University (AUH) with the numbers 2771, 2772 and 2773.

Keywords: New record, *Cleome scaposa*, Cleomaceae, WadiAmij, Western desert, Iraq.

Introduction

Cleomaceae is a small family of flowering plants in the order Brassicales, comprising more than 300 species belonging to 9 genera of which *Cleome* L. is the largest genus with about 180- 200 species (Aparadh *et al.*, 2012), in Iraq contain 6 species distributed on 2 genera (Town send and Guest, 1980). In the Flora of west Tropical Africa pointed to 150 species of the genus *Cleome* involving *Cleome scaposa*. In the United Arab Emirates (Karim, Fawzi, 2007; Mahmoud *et al.*, 2018) mentioned 7 species distributed in sandy soils of the desert regions, while Migahid and Hammouda (1978); Al-Aklabi *et al.* (2016) and Kasem (2016) stated 10 species of the genus *Cleome* involving *C. scaposa*. In Egypt (Boulos, 1999; Kasem, 2016) pointed to 9 species, while in Qatar (El Amin, 1983), Libyan (Gawhari *et al.*, 2018) and Yemen (Al-Hawshabi, 2107) stated 2 species which are *C. amblyocarpa* Barr. & Murb. and *C. scaposa*. In general, the species is distributed in Tropical and North Africa, Arabian Peninsula and south of Asia, including India (Otaghvari *et al.*, 2015) and Pakistan (Hussain and Perveen, 2015; Iqbal *et al.*, 2016). It is considering as a medicinal plant wealth in some countries such as India (Otaghvari *et al.*, 2015), where leaf extract is used to treat fever, colic, and cancer (Abbasi *et al.*, 2018), some studies have also shown the importance of this plant in the treatment of diabetes (Munir and Qureshi, 2018).

There are several local names for the *C. scaposa* such as (HERIAZA) in the United Arab Emirates (Karim and Fawzi, 2007), and (ZEFRA) in Qatar (Norton *et al.*, 2009), while in Saudi Arabia it was

called (AJRAM HINDI) (Migahid and Hammouda, 1978). There are many similar studies (Sardar, 2017; Haloob, 2016; Al-Mayah and Al-Asadi, 2017) of this study in Iraq, which recorded new plant species on the country, in Iran (Saghafi-Khadem, 1998), two new species of the *Cleome* L. were recorded, in Saudi Arabia (El - Shaboury *et al.*, 2018), one study has recorded three new species of the *Solanum*, also, some studies have recorded a new genus to the Flora of Saudi Arabia (Al-Robai *et al.*, 2018).

This study assured the presence of *Cleome scaposa* in Iraq based on the modern collection, in addition to taxonomic treatment including amorphological character for the Floral and vegetative parts, to give an accurate description of the species being first described in Iraq.

Materials and Methods

During the field trips to selected areas within the western desert district of Iraq have been done in 2018, some plant specimens were isolated and identification based on key especially in Flora of West Tropical Africa (Hutchinson and Dalziel, 1954), Flora of United Arab Emirates (Karim, Fawzi, 2007), Flora of Saudi Arabia (Migahid and Hammouda, 1978) and Flora of Egypt (Boulos, 1999), the specimens have been identified, then preserved in National Herbarium of Iraq (BAG) and Herbarium of Anbar University (AUH), with the Label contains some information about the plant specimen presence location as shown in the map (Figure 1) has been given. Morphological characters were studied by dissecting microscope and picturing by a

Japanese camera, and the pollen grains were studied after obtained from the fleshy plant samples that were fixed in F.A.A. solution and preserved in 70% ethyl alcohol. A Nikon camera was also used to photographing the different floral and vegetative parts with some necessary drawing and the scientific terms that used in this study have been depended on (Harris and Harris, 1994; Beentje, 2010).

Results and Discussion

Cleome scaposa DC. prodr. 1:239. 1824 pax & Hoffm, l.c. 4; Hedge & Lamond, l.c. 15.; Migahid and Hammouda, Fl. Saudi Arab. 1:59 (1978); Boulos, Fl. of Egypt, 1: 178 (1999); Karim&Fawzi, Fl. Uni. Arab Emira. 1:220 (2009).

Syn.: *Cleome gracillis* Edgew.

Cleome linearis Stocks ex. T. Anders.

Cleome papillosa Steud.

Annual, herb, height 15-38 cm, stem erect, branching in the lower half, cylindrical, villous and glandular hairy above, shorter non-glandular hairs also present, pale green, 6-14x0.2-0.4 cm.. Leaves simple, petiolate, exstipules, alternat-spiral, margin entire with glandular hairs, apex acute or rounded, base cordate or semi-cordate, glandular indumentum; lower cauline leaves cordate or orbicular, dark green, 15-18 x 11-13mm.; upper cauline leaves cordate, ovate or cordate-reniform, dark green, 7-12x6-9mm., petioles cylindrical, pilose pubescent, pale green-yellow, 2-9x0.6-1.7mm. Bracts circular, apex caudate, base rounded, margin glandular hairy, green, 103-1.8x1.2-1.9mm. Flowers bisexual, in abracteate simple racemes, actinomorphic, pedicels slender but rigid, densely glandular in the upper half, glabrous in the lower half, patent-erect and straight in fruit, 3-8x0.10-0.15 mm., usually greenish. Calyx of 4 sepals, slightly fused at the base, narrowly lanceolate, apex acute-acuminate, densely glandular, green, 1.3-1.5x 0.15-0.20 mm. Corolla of 4 equal petals, free, oblanceolate, margin entire, apex obtuse- mucronate, base attenuate- narrowly cuneate, white, pale pink at the top, 2.8-3.2x0.9-1.2mm. Androecium of 6 equal stamens, free, in one whorl, filament filiform, yellow,

1.7-1.9x0.9-0.11mm.; anthers narrowly oblong-lorate, dark yellow, basifixed attachment with the filament, 0.8-0.9x0.18-0.22mm. Gynoecium of 1 pistil, syncarpous, ovary superior, cylindrical, 1-locule, glabrous, green, 2.2-2.4x 0.40-0.44mm.; style single, filiform, green, 0.27-0.35x 0.17-0.19mm.; Stigma capitate, green, 0.18-0.19x0.22-0.23mm., gynophore absent. Fruit a capsule, cylindrical, dehiscent into 2-valves, shiny green, 18-22x0.9-1.1mm. Seeds numerous, roundish, amber (brownish yellow), minutely granulate, glabrous, 0.72-0.75x 0.70-0.73mm. (plates 1,2). Pollen grains cream (white with a faint tinge of yellow), single, tricolpate, broadly ellipsoid in equatorial view, planaperturate deltoid in polar view, small size according to Erdtman (1971), equatorial axis 13-15 μ m., polar axis 18-21 μ m. (plate 3). Stomatal complex anomocytic, in both surfaces of leaves, guard cells kidney-like, 13-15x4-5 μ m. (plate 4).

Type: In Aegyptio Coll. Ign. (G).

DWD: WadiAmij (40 km. south-east of Rutba), 550 m. alt., 5.5. 2018, Mohammed O. Mousa, 59783 (BAG).

Environment and Presence

Found as individuals in the region, on the sandy soils; altitude: 500m.: flowering period: Mid-March to May. Found in WadiAmij within Western Desert district (DWD). (Figure 1).

By looking at the map of the world distribution of *Cleome scaposa* (Fig. 2), we find that the desert region of Iraq is the most suitable area for the species success in the new environments because of the great similarity between the old and new environment, especially this species of plants that grow in the desert, as well as strong winds and torrents in winter seasons that contribute to the transmission of the seeds to far away.

Cleome scaposahas some characters differ from the near other species such as *C. glaucescens* DC. that found in Iraq and has following characteristics: Annual herb, non-aromatic, corolla white or pinkish, actinomorphic flowers, in few-flowered lax racemes fruits (capsules) are shorter, seeds are smaller and minutely granulate- glabrous (Plate 5).

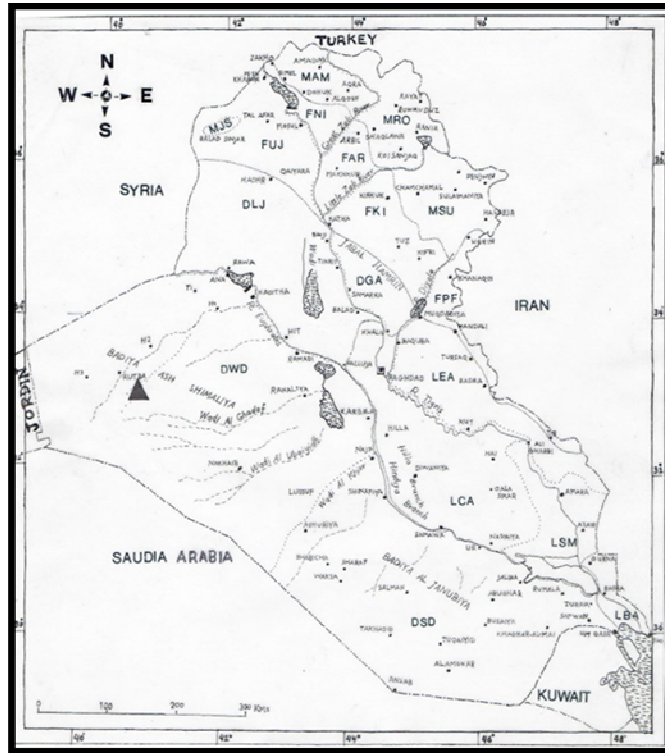


Fig. 1 : A map of Iraq shows the districts according to Guest (1966) ▲ *C. scaposa*

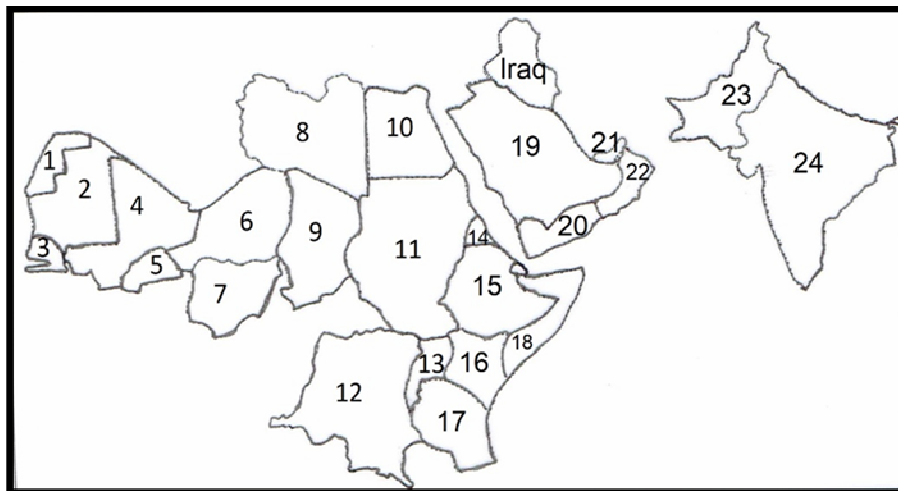


Fig. 2 : Distribution of *C. scaposa* according to Hutchinson and Dalziel (1954)

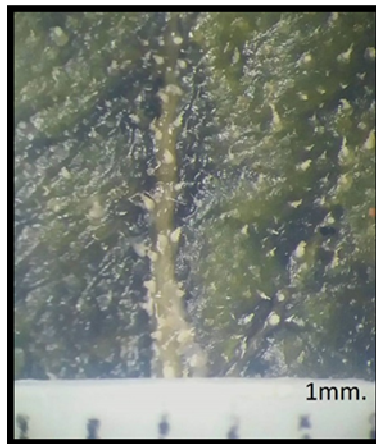
- 1-Maghreb 2- Mauritania 3- Senegal 4- Mali 5- Burkina 6- Niger 7- Nigeria 8- Libya 9- Chad 10- Egypt
 11- Sudan 12-Zaire 13- Oganda 14- Eriterea 15- Ethiopia 16- Kenya 17- Tanzania 18- Somalia
 19- Saudi Arabia 20- Yemen 21- United Arab Emirate 22- Oman 23- Pakistan 24- India



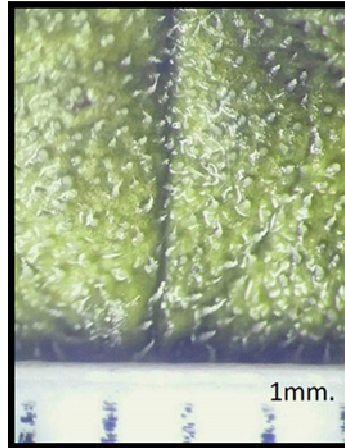
Lower cauline leaves



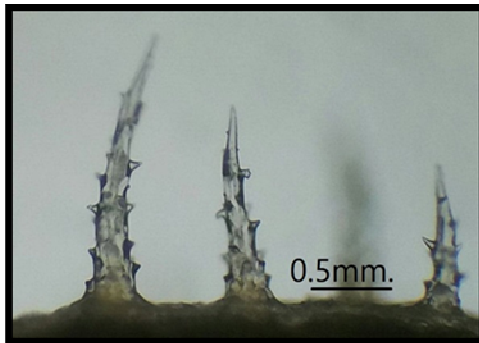
Upper cauline leaves



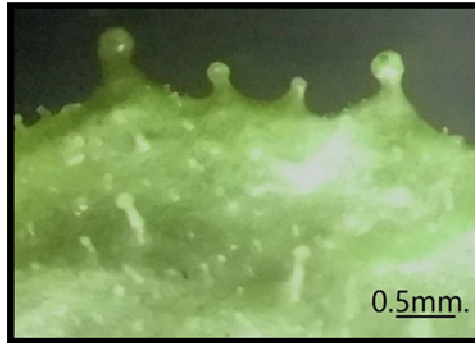
Lower cauline leaves: abaxial



Lower cauline leaves: adaxial

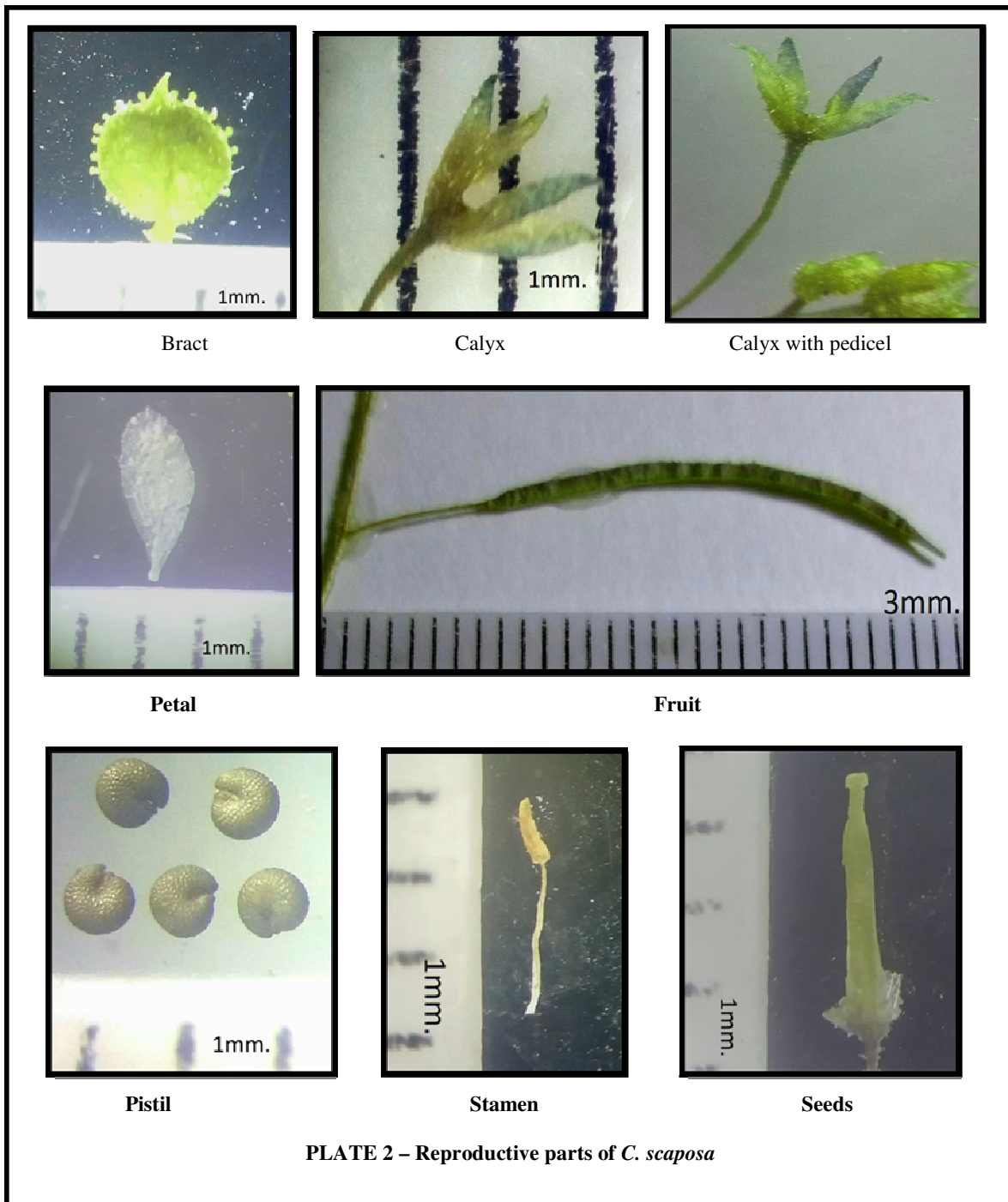


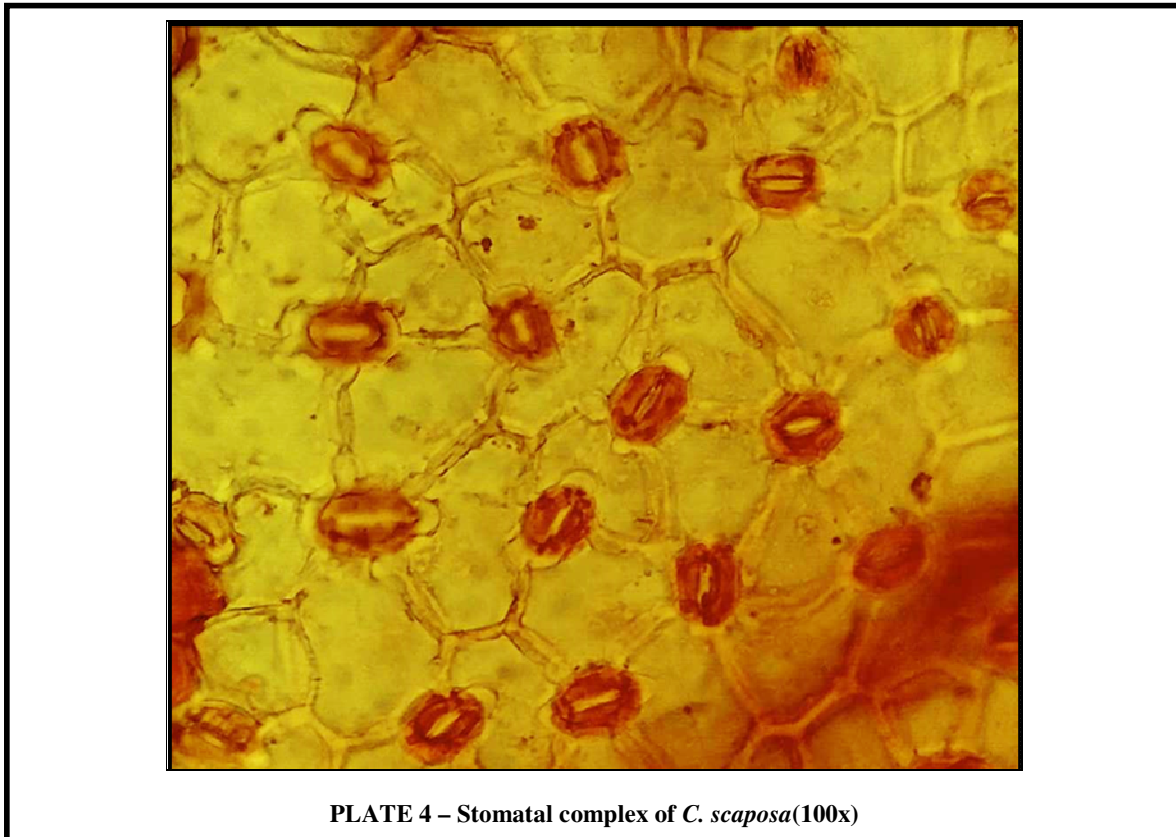
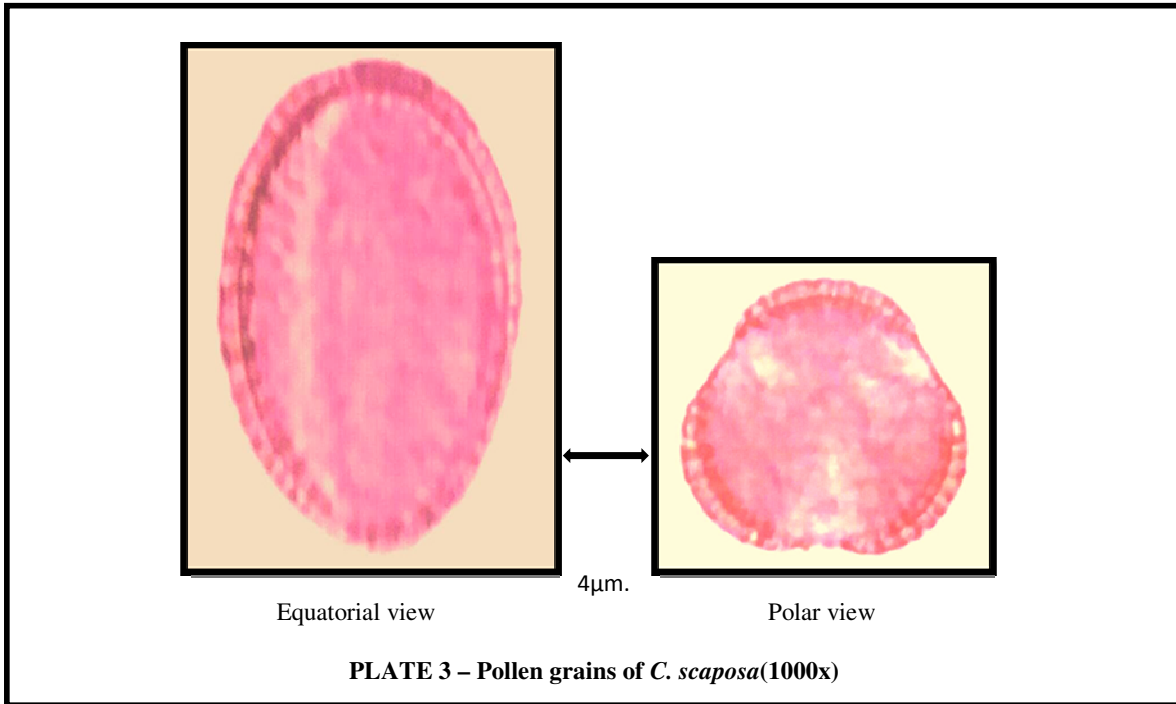
Branched non-glandular hairs



Glandular hairs

PLATE 1 – Vegetative parts of *Coleome scaposa*





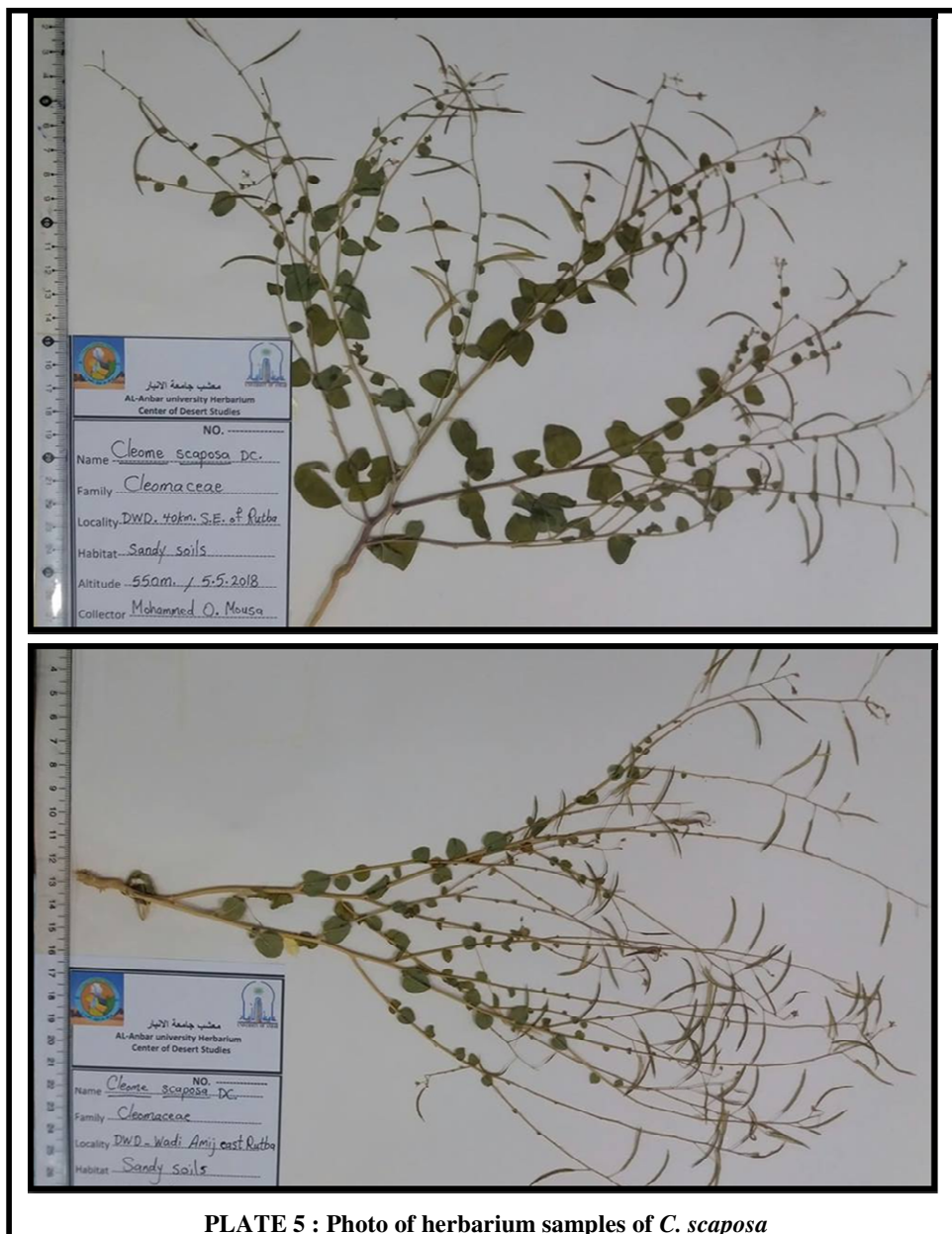


PLATE 5 : Photo of herbarium samples of *C. scaposa*

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