Biochem. Cell. Arch. Vol. 19, No. 1, pp. 175-178, 2019 | www.connectjournals.com/bca | *ISSN 0972-5075*

THE MORPHOLOGICAL AND POLLEN GRAINS STUDY OF *IPOMOEA CARNEA* JACQ. (CONVOLVULACEAE) IN IRAQ

Aseel F. Al-Hussaini

Department of Biology, College of Education for Pure Science (Ibn Al-Haitham), University of Baghdad, Iraq
e-mail: aseelalhussaini84@gmail.com, estabraq_alqaissi@yahoo.com

(Accepted 21 February 2019)

ABSTRACT : The current study included a detail morphological study of all parts of the species *Ipomoea carnea* Jacq. (Convolvulaceae) cultivated in different gardens, the roots, stems, leaves, flowers and fruit were studied in detail, also the pollen grains were studied and there are photographs for all the parts were putted.

Key words : *Ipomoea carnea* Jacq., convolvulaceae, pollen grains.

INTRODUCTION

Ipomoea carnea plant was returned to the Convolvulaceae family, which has 50 genus and more than 1200 species spread in moderate and hot areas (Meira *et al*, 2012). It was represented in the Iraqi flora by 27 wild species and 7 cultivated species. The species of this family were of economic importance, including ornamental plants, which are the source of sweet potatoes (sweet tuber roots eaten cooked to contain a high proportion of sugar and starch) some of which were harmful plants *Cuscuta* spp. which grows parasitic on clover and other plants (Al-Kateb, 1988). The leaves are slightlypurgative; a latex in the plant was used to treat skin problems and the leaves-cooked and eaten as a vegetable even though they are slightly purgative (Rao *et al*, 1990; Górniak *et al*, 2010). The species has several local named from it pink morning glory and bush morning glory (Austin, 1986).

MATERIALS AND METHODS

The morphological study

The study relied on soft vegetarian specimens collected over the years (2017-2018) and studied the different plant parts and detailing the use of anatomy microscope and compound microscope, the plant parts of the species under study were phtted.

Study of pollen grains

The newly-opened flowers or mature floral buds in the field were fastened directly to the Carnoy solution for 24 hours and then washed with an ethylene alcohol 70%. The refrigerator was kept in the freezer with the same alcohol concentration untilit was used, and the Al-Mayah method (1983) as reported by Al-Mashhadani (1992) was used, which included removal mature anther and put in awatch glass and added the pigment of safranin-glycerine, and then the anther opened by two dissected needle and mashed to extract the pollen then move the pollen after dragging it with the dye mediated by dropper to a clean glass slide and put the cover slide and then check the slide under a compound light microscope and calculated the dimensions of the pollen grains using the exact scale of the ocular micrometer.

RESULTS AND DISCUSSION

Morphological study

The shrubs reach its height of 3.5 m and has tap root. It was stem erect, medium-branch, number of branches (5-6) and its length (3-3.5 m), cylindrical shape form, branching from the base. The mature branches were woody substratum and whitish green colors. While the immature branches were rather flexible and green colors, nodes of stem spaced and the distance between nodes and other ranges (15-20) mm. (Fig. 1).

Simple leaves, alternate, estipulate, petiolate, green color. The length of blade ranged from (120-300) mm and width (80-160) mm, cordate form, with acuminate apex, its margin entire, cordate-subcordate basis, petiolateand the length of the petiole (70-170) mm, venation by pinnately reticulate (Fig. 5).

The flowers were axial, solitary andarrangement in cymose inflorescences, compounddichsium, deciduous bracts (Fig. 10), boat shaped, concave length (3) mm and width (2) was only one count and it's shorter than the calyx. The flower with a pedicel cylinder, erect and a length

Fig. 1 : Plant in the field at flowering stage.

(10-15) mm, was a light green (Fig. 4).

Calyx has (5) sepals (Fig. 6), separate, overlapping, ovate, concave, thick flesh, ranging in length (4-4.5) mm and its width (2) mm one of them was taller than the rest, its colors were green and its light green margin, and the marginswere full entire and the top was acute.

Corolla consists of (5) synpetalous and longitudinally wrapped inside the bud and the corolla with funnel form and pink-violet and dark violet at the base of the corolla tube, the length of the corolla (70-80) mm and width (10-15) mm and a tube length of corolla (40) mm and the length of corolla limb (40) mm (Figs. 2, 3, 4).

Stamens itsnumbered (5) were based on the corolla tube (epipetalous), which was not equal to the length (2) of which was longer than the rest of the stamens. The stamens were united with the base of the petals at distance (3-4) mm, lower part of the filamentous hairy with dense glandular trichrome, purple, swollen and the upper part of the filamentous was white color, filiform, length of long stamens (30-35) mm and the rest stamens with length to 25 mm. The connection of anther with filamentous basifixed, oblong, bilobed up to 4 mm with a sagittate base with whitish yellow, the anther opened longitudinally (Fig. 7).

One pistil its length (26-27) mm and the stigma bilobed, globulose and its length up to 2 mm width (1) mm and style cylindrical with a yellowish white color its length up to (20) mm, superior ovary, conical form, yellowish white colorits length up to (4-5) mm, bilocule and the ovary settles on the nector disc, ring-like, with a yellow color (Fig. 8).

The fruit was a simple, dry dehiscent capsule, which opens septifragally, its length (10-12) mm and its width

Fig. 2 : Corolla.

Fig. 3 : Corolla limb.

Fig. 4 : Longitudinal section of flower.

Fig. 5 : Leave **A-** Abaxile, **B**- Adaxile.

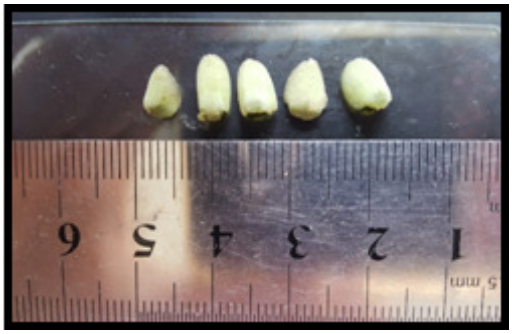

Fig. 6 : Sepals.

(8-12) mm with pedicellate, it looks subglobular and the apex was pointy and the spherical base, its light green when it was immature and turns into brown when mature. The fruit was surrounded by five sepals where the calyx was persistent and the fruits contain 4 seeds of dark brown and covered with dense hairs (Fig. 6).

The age of the plant and the maturity of the leaves have obvious effects on the extent of the variations, and the upper leaves have larger blade and longer scape than the ones above (Abbas, 1991).

The current study has shown that the solitary or cymose and that the calyx was persistent, and funnel form and the stamens its numbered (5) as confirmed by the study was the presence of the nectar disc (Fig. 9) and this corresponds to what was stated in Keeler and Kaul (1979) and Keeler (1980).

Pollen grains study

The current study showed that the pollen grains of species under study was monads, sheroidal, isopolar and not has furrows with aperture type polytreme, pantoporate

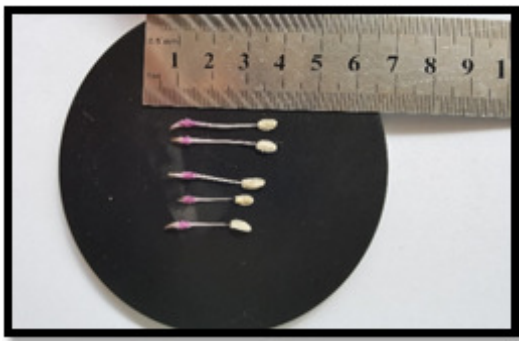

Fig. 7 : Stamens.

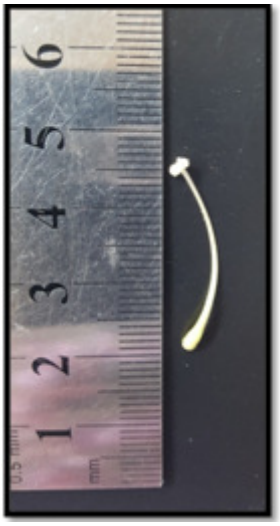

Fig. 8 : Pistil.

Fig. 9 : Nectar disc.

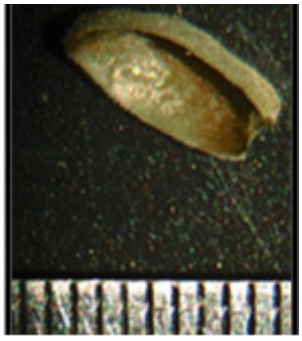

Fig. 10 : Bract.

and its diameter (5.6) µm with equidistantly where it reaches the distance between the apertures to (5.6) µm with echinate sculpturing, and the length of the spine (5.6-11) µm, the distance between the two spines (5.6-11) and the spine was slender and its apex was acute, and the size of the pollen depending on the value of the longest axis and according to Erdtman (1971) they were from a medium-sized category where the longest axis was no longer than the (47.6 µm) (Fig. 11).

The current study agrees with the study Austin (1978) in the pollen of study species polytreme, pantaporate and with echinate.

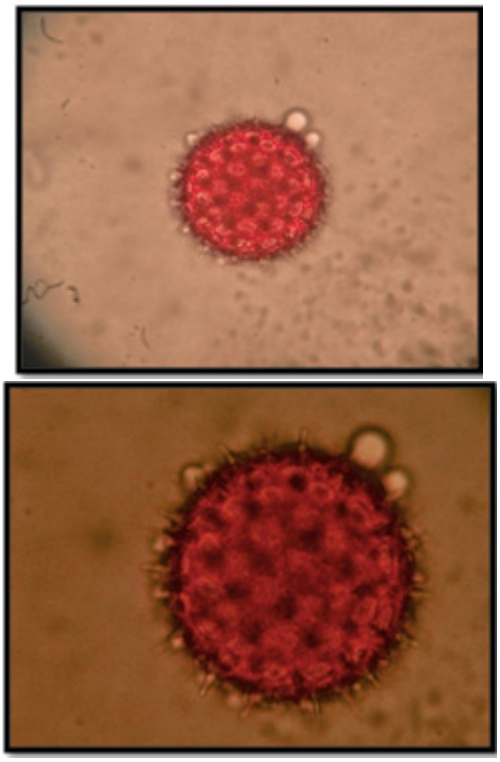

Fig. 11 : Pollen grains. **A-** 10x, **B-** 40x.

CONCLUSION

The Convolvulaceae is essentially family having a large variety of pollen morphotypes.

REFERENCES

Abbas Y K (1991) Taxonomic Study of *Heliotropium* L. (Boraginaceae) in Iraq. *Ph. D. Thesis*, College of Science, University of Baghdad: 250 pp.

Al-Kateb Y M (1988) Classification of seed plants, first edition, Dar al-Kutub for printing and publishing. University of Mosul: 592 pp.

Al-Mashhadani A N (1992) Comparative Taxonomic Study of *Onosma* L. (Boraginaceae) in Iraq, *Ph.D. Thesis*, College of Science, University of Baghdad: 295 pp.

Al-Mayah A A (1983) Taxonomy of *Terminalia* (Combrataceae), *Ph. D*. University of Leicester., U. K. 1983.

Austin D F (1986) *Convolvulaceae*. p. 652-659. In : Barkley T M (ed.) Flora of the Great Plains. Great Plains Flora Association, Univ. Press of Kansas. Lawrence.

Austin D F (1978) Morning glory bees and the *Ipomoea pandurata* complex (Hymenoptera: Anthrophoridae). *Proc. Entomol. Soc. Wash.* **80**(3), 397-402.

Erdtman G (1971) Pollen morphology and plant taxonomy angiospern (An introducing palynology 1) 2ed. Hanfner publishing Co. New York: 553 pp.

Górniak S, Gotardo A and Pfister J (2010) The effects of *Ipomoea carnea* on neonate behavior: A study in goats. *Toxicol. Lett*. **196**, S186.

Keeler K H and Kaul R B (1979) Morphology anddistribution of petiolarnectaries in *Ipomoea* (Convolvulaceae). *Am. J. Bot*. **66**, 946-952.

Keeler K H (1980) The extrafloralnectaries of *Ipomoea leptophylla* (Convolvulaceae). *Am. J. Bot*. **67**, 216-222.

Meira M, da Silva E P, David J M and David J P (2012) Review of the genus *Ipomoea*: traditional uses, chemistry and biological activities. *Revista Brasileira de Farmacognosia* **22**(3), 682-713.

Rao K S, Rangan D, Singh K, Kaluwin C, Donals E, Rivett G and Jones P (1990) Lipid, fatty acid, amino acid and mineral composition of five edible plant leaves. *J. Agric Food Chem.* **38**, 2137-2139.