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VENATION PATTERN AND LEAF ARCHITECTURES OF *CORDIA MYXA* L. FROM BORAGINACEAE FAMILY

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ABSTRACT : A study refers to the venation patterns of *Cordia myxa* L. species. Venation systems have been classified with the design for each order and in the present study, the venation is pinnate and the type of the first-order veins was brochidodromous, cascade type for the second-order veins and the type of third order veins was lattice and percurrent. The areoles are variable in size, they are triangular or polygonal.Studied of venation is necessary for leaf architecture, because which associated with the development of lamina and patterns formed by groups of venation designs.

Key words : Venation, *Cordia myxa,* taxonomy.

INTRODUCTION

The leaves are extremely polymorphic organs and give varied features, the veins and veinlets which form the vascular system called the venation were an important feature of leaves (Metcalfe and Chalk, 1979). Ettingshausen (1861), which classified the patterns of leaf venation likewise Lee (1948) defined the shape classes of leaves also, Hickey (1973) and Hickey and Wolfe (1975) classified the patterns design of angiosperms leaves and Pole (1991) described and modified the terminology for angiosperm leaf architecture.

The architecture of leaf refers to the aspect of morphology, which applies to the locative configuration and coordination of those elements making up part of a plant without regard to histology, function, origin and homology, the leaf architecture referred to the morphology of leaf like as venation pattern, the configuration of margin and shape of the leaf (Metcalfe and Chalk, 1979).

The leaf architecture is characteristics hierarchy of venation used the veins, which are grouped into patterns and these patterns are located in zones and segments of the leaf lamina also leaf venation pattern refers to the relationship between veins and between veins and the margin of the leaf (Hickey, 1980).

The aim of this study was to diagnoses the leaf patterns of *Cordia myxa* L. from Boraginaceae family because of its importance to isolating and diagnosing the species and distinguishing it from others plants, also to recognize the design and pattern of veins in the leaf lamina.

MATERIALS AND METHODS

The leaves were collected at flowering stage from Diyala Governorate located in eastern of Iraq, Coordinates: 33°53' N 45°4' E. Leaf samples were placed in 0.5% sodium hypochlorite for 10 min to remove the chlorophyll pigments. Finally, fixed and photographed by KRÜSS dissecting microscope, a terminology defined by Metcalfe and Chalk (1979).

RESULTS

Leaves of *Cordia myxa* L. from Boraginaceae family are simple,dark green-colored, broad, obovate to elliptic-ovate, up to 13.5 cm long, base cuneate, apex acuminate, petiole 2.5-5.5 cm long, margin of leaf straight with tooth at the sites of the ends of veins (Fig. 1).

The venation is pinnate with a single primary vein, the first, second and third veins are major. Primary vein which is known midrib, the midrib is the central vein of a leaf, considered strongest vein in the leaf and the main point for the following veins that branches out of it (Fig. 2).

The study also showed that the system of venation simple type, the type of the first veins order is craspedodromous, which the veins ends to the edge of margin, the type of second veins order are Cascade in this type the branching may be straight or curved and the

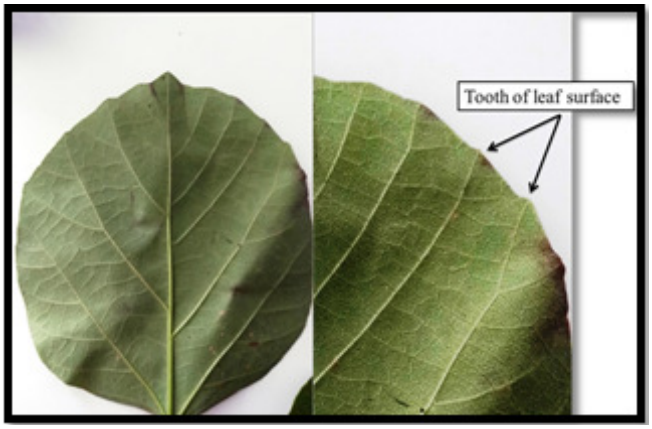

Fig. 1 : Shape of leaf and leaf margin in the *Cordia myxa.*

Fig. 2 : Five order venation patterns of leaf, 1^0: midrib, 2^0 second vein, 3^0: third vein, 4^0: forth vein, 5^0: fifth vein, in the *Cordia myxa.*

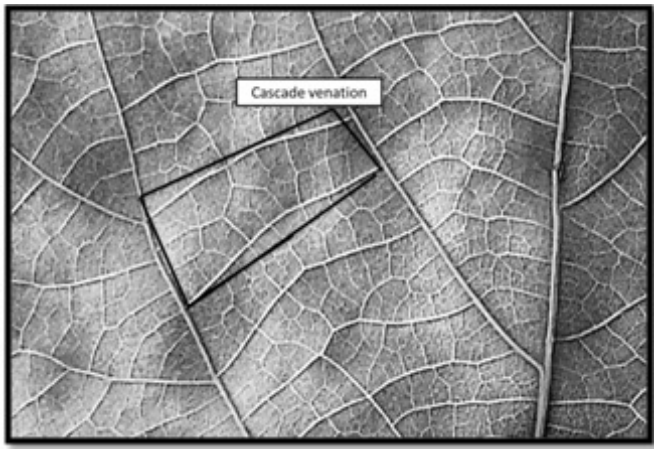

Fig. 3 : Venation patterns of leaf appear the Cascade venation in the *Cordia myxa.*

Fig. 4 : venation patterns of leaf appear the zone and segment in the *Cordia myxa.*

venation, which is the veinlets are not directly rolled up and some of their ends extend to intersect with the central vein and made space connected to it extending along the middle vein and sides (Fig. 3) and the third veins type are lattice and percurrent.

The branching out of the midrib known secondary veins smaller than it, which in turn branch to the veins of the third, fourth, spread and intersect in a random ramifying form.

The Areoles, which result from the convergence of the triangular axes between all secondary veins were completing polygonal and the veinlet were not equal in size and shape.

Also, this study can diagnoses the zones and segments of leaf lamina, Zone refer to the areas of the lamina like as the channel of veins patterns and it may be divided into segments (Fig. 4).

DISCUSSION

Leaf venation varies in the angiosperm plant by pattern and arrangement (Hickey, 1973). Metcalfe and Chalk (1979) refers to the first, second and third veins order form and considered as major venation pattern in the leaf. Vein systems have been classified into types In *Cordia myxa*, the major venation pattern is pinnate type craspedodromous include cascade venation.

The classification continues with gradually from major order veins until the areolation are branched into the areola. Hickey (1973) classified the vein endings into simple and branched. The present study has been reported that areoles are variable in size and they are triangular or polygonal.

In general, the present study refers to leaf architecture terminology of Metcalfe and Chalk (1979) and this study can help to taxonomy and diagnoses the important characters of the plant under study.

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