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Document Title : Morphological And Comparative Anatomical Studies On Some Species Of Acacia (Fabaceae) Growing In Wadi Fatma In Makkah Al-Mukaramah Region
دراسات مورفولوجية وتشريحية مقارنة لبعض أنواع الأكاشيا (الفصيلة البقولية) النامية في وادي فاطمة بمنطقة مكة المكرمة

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Abstract : The genus Acacia L. is a member of the subfamily of Mimosoideae (Fabaceae). The genus includes between 1100- 1300 species, widespread in the tropical, subtropical and the arid regions of the world. About eighteen species are growing in the western and southwestern regions of Saudi Arabia, which are distributed through the plant communities or as communities of Acacias in Al-Sarawat high mountains or in the wadies valley and plains. Acacia species resemble morphologically, that the confusion on their identification can be drawn. Wadi Fatma is one of the main wadies in Tihama plain of Saudi Arabia. This wadi is well known by the Acacia species, as a part of the many growing species in it. The aim of the present work is to do morphological and comparative anatomical study of wood of the Acacia species growing in Wadi Fatma. The study includes the morphological description of the Acacia species and studying of the structure woody stems of: Acacia asak, A. ehrenbergiana, A. gerrardii, A. hamulosa, A. mellifera, A. raddiana, A. seyal and A. tortilis. The results of the morphological features of the studied species show the presence of major and minor morphological characters, which can be used for dividing Acacia species into two groups: The first consists of A. asak, A. mellifera and A. hamulosa, these can be distinguished by the pedicellated spike inflorescence, prickles instead of spiny stipules. Acacia mellifera characterized by the compound pinnaty leaves of 2 pairs leaflets and the short curved prickles in pairs; whereas, A. asak, and A. hamulosa can be distinguished by the currency of compound pinnaty leaves of 2-7 pairs leaflets. The hard short curved tri- prickles separate, A. asak from A. hamulosa, which their middle prickles, is curved down and the others directed upward. The second group includes: A. ehrenbergiana, A. gerrardii, A. raddiana, A. seyal and A. tortilis, which are characterized with the pedicellated head inflorescence and the spiny stipules. Species of A. tortilis, and A. raddiana can be distinguish from other three species in this group by the spiral twisted legumes. Branches, leaves and legumes of A. tortilis are pubescent; while all are smooth in A. raddiana. The curved legumes separate species of A. ehrenbergiana, A. gerrardii, and A. seyal into two subgroups as follow: A. gerrardii with a pubescent branches, leaves and legumes, while A. ehrenbergiana, and A. seyal together, where their legumes are smooth. Pinnate Leaflets of A. ehrenbergiana arranged in 1-2 pairs, and 1-6 pairs in A. seyal. Also the anatomical study of the woody stems -wood anatomy- of investigated species shows the occurrence of major and minor characters that can be used in the separation of studied species. Apotracheal and paratracheal axial parenchyma are the two major characters, while the ray parenchyma rows number and their length, in addition of fiber wall thickness are the minor characters. Based on those characters, investigated species can be divided into three groups: one consists of A. ehrenbergiana only, which might be distinguished by the apotracheal or a scanty paratracheal axial parenchyma. The second group includes species of A. asak, A. gerrardii, A. hamulosa A. mellifera, A. raddiana and A. tortilis, which are characterized by varied paratracheal axial parenchyma. Species in this group can be spared into two subgroup, first consists of A. asak, and A. tortilis, with vasicentric paratracheal axial parenchyma and the uniseriate rays in A. tortili, and multiseriate rays in A. asak. The second subgroup includes A. gerrardii, A. hamulosa A. mellifera, and A. raddiana, which they are characterized by the aliform to aliform confluent paratracheal axial parenchyma. Acacia mellifera differ by the uniseriate rays, while it is multiseriate in: A. gerrardii, A. hamulosa and A. raddiana. Wall fiber thickness and the ray length might be used in the separation of the last species, the medium thickness of wall fiber observed in A. gerrardi, thick walled fiber in A. hamulosa and A. raddiana, also the rays lengths up to 300 ? were seen in

A. hamulosa, where rays up to 700 ? in A. raddiana. The third group consists of A. seyal which it is characterized by the scanty paratracheal axial parenchyma and rays of 1-6 rows. Two keys are drawn, one based on the morphological characters, the second on the anatomical characters of the woody stems.

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