

ENUMERATION OF LEAF ARCHITECTURE IN THE GENUS *ALYSICARPUS* DESV.

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ABSTRACT

Studies of leaf architecture in the genus *Alysicarpus* are investigated. *Alysicarpus* a tiny genus belongs to family Fabaceae. In the present work 15 taxa of the genus are taken for the study. The observation shows lot of variations in venation patterns. The size and aeriole of all the taxa shows variation. After observing all the venation pattern & aeriole types in 15 taxa of the genus, it appears that 15 taxa can be grouped into seven categories.

KEY WORDS: Leaf, Architecture, *Alysicarpus*, venation.

INTRODUCTION

Alysicarpus, a small genus of family *Fabaceae* (Papilionoidae tribe Desmodae) comprises about 27 species and about 15 intraspecific taxa. It is distributed in tropics and subtropics of world (Ohashi *et al.*, 1981). India harbors nearly 60% of the taxa and is richly represented in the Maharashtra by 48 taxa, 12 species and 6 varieties (Pokle D S, 2000). Maximum endemism of the genus is in India. Out of about 42 taxa, 12 are endemic to India (Sanjappa, 1977). This parameter will help for taxonomic study of the genus may be useful for considering the origin of genus. The present study deals with the leaf architecture from different taxa of genus *Alysicarpus*. In this genus most of the taxa are categorized into seven groups on the basis of venation pattern this investigation was undertaken. Hickey, (1973) considered venation pattern as a good taxonomic parameter. He provided a thorough classification of venation patterns. It was felt that generated in this field will be much data helpful for taxonomy of the genus.

During these studies all 19 taxa were considered primarily, however due to certain difficulties especially for photographic evidences and want of proper material 15 taxa were selected for presentation here. The venation pattern in the genus is also not attempted before and thus data produced here is for the first time.

Following 15 taxa of genus *Alysicarpus*. Desv along with locality & field numbers are provided below. The herbarium specimens are deposited in Dept of Botany, Dr Babasaheb Marathwada University, Aurangabad, M.S.

- 1) *A. bupleurifolius* (L.) D.C. var. *bupleurifolius*. (DSP 009. Nanded)
- 2) *A. bupleurifolius* (L.) D.C. var. *gracilis* Baker. (ASD 995. Gautala. Aurangabad)
- 3) *A. gamblei* Schindl. (ASD 968 Belgaum(Karnataka))
- 4) *A. heyneanus* Wt & Arn. var. *heyneanus*. (RPP 604 Majalgaon. Beed)
- 5) *A. heyneanus* Wt & Arn. var. *ludens* (Baker) Pramanik & Thoth.(ASD 611 Majalgaon)
- 6) *A. scariosus* (Rottl ex Spreng) Grah ex Thw. var. *scariosus*. (ASD 661 Rajkot)
- 7) *A. longifolius* (Rottl. ex Spreng) Wight & Arn. var. *major*. Pokle. (RPP 651 Bodeli)
- 8) *A. tetragonolobus* Edgew. (ASD 929 Satara)
- 9) *A. luteo-vexillatus* Naik et Pokle. (ASD 958 Savkheda)
- 10) *A. pubescens* Law. var. *pubescens*. (ASD 960 Kolhapur)
- 11) *A. pubescens* Law. var. *vasavadae* (Hemadri) Sanjappa. (ASD 605 Majalgaon)
- 12) *A. monilifer* (L.) DC. var. *monilifer*. (ASD 915 Islapur, Nanded)
- 13) *A. vaginalis* (L.) D.C. (ASD 679 Abu road, Mt Abu Rajasthan)
- 14) *A. ovalifolius* (Schumach) J. Leonard. (ASD 947 Aurangabad)
- 15) *A. hamosus* Edgew. (RPP 625 Bidar).

MATERIALS AND METHODS

The leaves from the fresh plants as well as herbarium sheets were used for the studies. In general 4-6 leaves were treated to reveal venation pattern. These leaves were selected from sheets of different localities and most representative one was selected for photography. Leaves from herbarium sheets were thoroughly washed and kept in 10% KOH solution. For 24 hours for leaf clearing. After thorough washing normal staining and drying was done for preparation of permanent slides. Venation patterns were observed and selected for photography. Classification of venation pattern studied was according to Hickey L.J. (1973). The table of observation is self-revealing and hence a very brief description of venation pattern is provided while pertinent point is discussed under subtitle, observations and discussions.

RESULT AND DISCUSSION

Four basic patterns of primary veins accommodate the venation patterns of 15 taxa under study. These are: Reticulodromous, Brachidodromous, Acrodromous and Eucamptodromous in the sequence of occurrence. Reticulodromous pattern was observed in maximum taxa (9); Brachidochromous in 3 taxa, Acrodromous in 2 taxa while Eucamptodromous in only 1 taxon. (Table 1).

Although there are 4 basic patterns of primary venation, secondary venation differs and thus there occurs 7 groups of species based on secondary venation pattern. (Table 1).

Table 1. Leaf Architecture

Sr. No.	Name	Primary venation	Secondary Venation	Tertiary Venation
1.	<i>A. bupleurifolius</i>	Brachidodromous	Ramified	Admedial
2.	<i>A. bupleurifolius</i> var. <i>gracilis</i>	Brachidodromous	Ramified	Random
3.	<i>A. gamblei</i>	Brachidodromous	Ramified	Random
4.	<i>A. tetragonolobous</i>	Reticulodromous	Ramified	Random
5.	<i>A. luteovexillatus</i>	Reticulodromous	Ramified	Random
6.	<i>A. heyneanus</i>	Reticulodromous	Ramified	Admedial
7.	<i>A. heyneanus</i> var. <i>ludens</i>	Reticulodromous	Ramified	Admedial
8.	<i>A. scariosus</i>	Reticulodromous	Ramified	Admedial
9.	<i>A. longifolius</i> var. <i>major</i>	Reticulodromous	Purcurrent	Sinuuous
10.	<i>A. monilifer</i>	Reticulodromous	Purcurrent	Sinuuous
11.	<i>A. vaginalis</i>	Reticulodromous	Purcurrent	Sinuuous
12.	<i>A. ovalifolius</i>	Reticulodromous	Purcurrent	Sinuuous
13.	<i>A. pubescens</i>	Acrodromous	Reticulate	Random
14.	<i>A. pubescens</i> var. <i>vasavadae</i>	Acrodromous	Reticulate	Random
15.	<i>A. hamosus</i>	Eucamptodromous	Purcurrent	Sinuuous

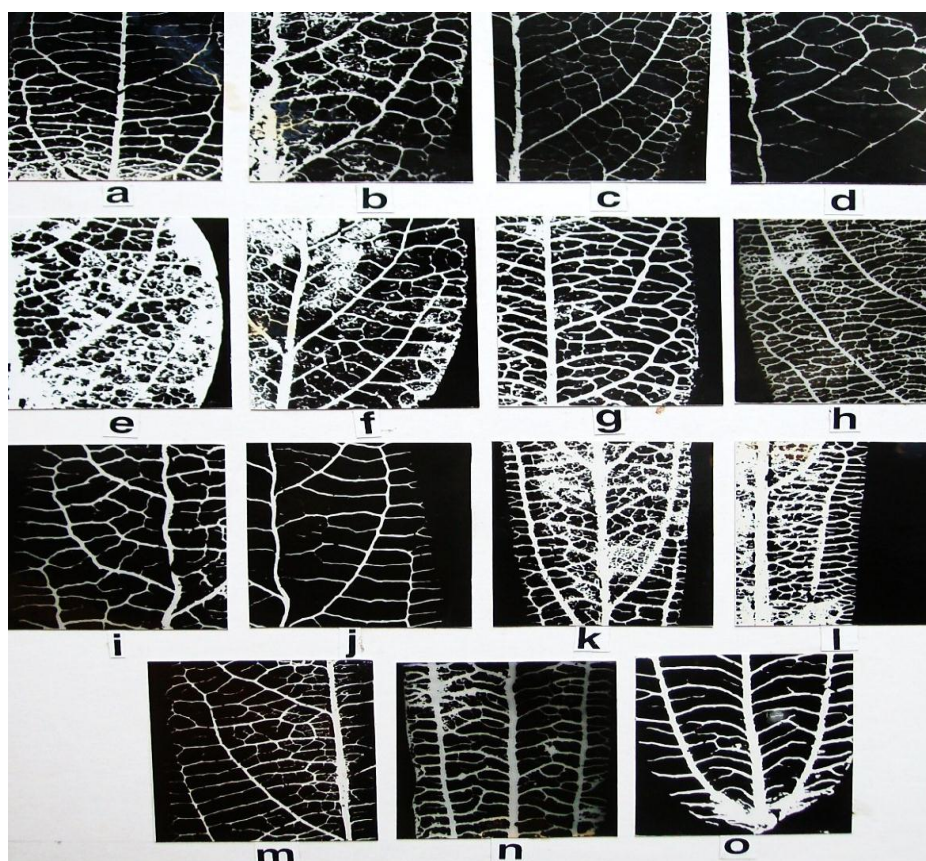


Plate 1. Leaf Architecture.

a) *A. bupleurifolius*, b) *A. bupleurifolius*, c) *A. gamblei*, d) *A. heyneanus*, e) *A. heyneanus* var. *ludens*, f) *A. scariosus*. g) *A. longifolius* var. *major*. h) *A. tetragonolobus*, i) *A. luteo-vexillatus* j) *A. pubscens*, k) *A. pubscens* var. *vasavadae*, l) *A. monilifer*, m) *A. vaginalis*, n) *A. ovalifolius* & o) *A. hamosus*.

The most commonly observed pattern is reticulodromous however this group show 3 subgroups based on secondary venation. In *A. tetragonolobus* and *A. luteovexillatus* secondary venation pattern is 'reticulate'; in *A. heyneanus* and *A. scariosus* it is 'ramified' while in rest of four species it is 'purcurrent' (Plate 1 – i, j, c, b).

Very closely allied species show exactly similar venation pattern e.g. *A. tetragonolobus* and *A. luteovexillatus*; *A. heyneanus* and *A. scariosus* etc. (Plate 1 – i, j, c, b).

A. hamosus show unique pattern in the genus i.e. Eucamptodromous. This species is also unique in its compressed pods which are similar to pods of *Desmodium*. Thus the venation pattern is a added parameter to its uniqueness in the genus.

A. longifolius show reticulodromous – purcurrent – sinuous pattern which is different than its allied species i.e. *A. heyneanus* and *A. scariosus*. The pattern of *A. longifolius* is exactly similar to *A. vaginalis*, *A. ovalifolius* and *A. monilifer* [These species along with *A. hamosus* are included in microcalycinae of Baker (1872)]. Besides pods of *A. longifolius* are also different from its allied group i.e. *A. heyneanus* and *A. scariosus*. (the group is popularly termed as rugosus complex). The feature i.e. venation pattern is an added parameter to the contention of author that microcalycinae has evolved from 'rugosus complex' through *A. longifolius* (Pokle 1992).

The most significant observation is case of *A. bupleurifolius*, *A. bupleurifolius* var. *gracilis* and *A. gamblei*. In these taxa basic pattern is Brachidodromous. However, in *A. bupleurifolius* it is 'ramified, admedial' while in other two taxa i.e. *A. gamblei* and *A. bupleurifolius* var *gracilis* is more closely related to *A. gamblei*. However more parameters will be required for transfer of this variety hence the transfer is not suggested here.

Based on venation pattern there appears 7 categories named as A, B, C, D, E, F & G groups of species within the genus, as indicated in Table. Very closely related species show exactly similar pattern up to tertiary venation. Thus venation pattern appear good taxonomic criteria to establish relationships within the genus. The important findings of present study is summarized below.

- *Alysicarpus bupleurifolius* var. *gracilis* appears more closely related to *A. gamblei*, however more data is required for the transfer of the variety.
- *longifolius* show venation pattern similar to microcalycinae and thus is a added parameter to the contention that "microcalycinae have evolved from *A. rugosus* complex" (Pokle, 1992).
- Venation pattern is a added parameter to the uniqueness of species *A. hamosus* within the genus.

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