ARTIFICIAL KEY TO THE PAPILIONACEÆ OF BOMBAY PROVINCE

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The following is an artificial key covering one of the most difficult groups of Bombay plants; the system followed here is the same as that of the 'Artificial Key to the Compositae of Bombay Presidency' published in the first number of the *Indian Ecologist*, in April 1946.

This key is primarily based on the colour and other obvious characters of the plants in question. Colour is not an important feature of the flower for the serious taxonomist; but experience with botany students has convinced me that colours are readily distinguished even by beginners and can, therefore, be of considerable help in tracing at least the genus of a given plant.

As to the method of using this key, the first step is to try and trace the colour of the flower. For this purpose it is important that fresh flowers be employed, that is to say, flowers which are fully open and have not yet withered. It often happens that of the flowers on a given spike or raceme, the uppermost are still in bud or at least are not yet fully expanded, whilst the lowest may be already wilting. In both cases, that is to say, with very old or with very young flowers, the colours are often considerably distorted as compared with those of the flowers about the middle of the spike or raceme. This is particularly the case with plants with pink or blue or lilac flowers, such as those belonging to the genera *Desmodium*, *Alysicarpus*, etc.

Once the colour of the flower has been ascertained, consult the key, and make sure of examining *all* the alternatives in the key; see the lines or paragraphs headed by the same number, they are all alternative among themselves.

A particular genus may come under various headings; this means that some species of the said genus have flowers of one colour, whilst other species of the same genus may have flowers of quite a different colour.

A possible source of doubt may be that on one and the same flower there may be more than one colour. In such cases take the most prominent colour as typical of the plant. If there are variations in the colour of the petals, take that of the standard as the proper colour of the flower, and if the inner and outer colours differ, take that of the inner surface of the standard as the correct one. If, however, the standard is missing or is inconspicuous, make use of the colour of the wings for the identification of the plant.

After the colours, attention is to be paid to the arrangement of the stamens in the flower; in examining the stamens, however, care must be taken, or the free stamen or stamens may be damaged in the process. In general the stamens are grouped according to three clear patterns: (*a*) Stamens 5+5, that is to say, the androecium is divided into two sections, each of 5 stamens with filaments partly united at the base. (*b*) Stamens 9+1, the lower 9 stamens having their filaments united partly from the base, the upper stamen being free or nearly so for its whole length. (*c*) Stamens 10 or fewer, but not definitely arranged according to the two previous groups.

For the rest this key is meant to cover most of the genera as given by Cooke. Two genera are excluded, *Stylosanthes* and *Eleiotis*; I have been unable to see any living specimen of these two genera or find any precise reference to the colour of these plants. No account has been taken in the preparation of this key of any paper or book published after Cooke's Flora; the latter is the standard book among students in Bombay and for practical purposes is the most complete work on the flora of this Province.

As in the case of the previous key, the present one is published with the hope that it may be useful to students and others interested in the very large Pea-flower family. Corrections and suggestions will be gratefully received by the author.

1. *Flowers white*:
   2. Stamens 5+5 ... *Dalbergia.*
   2. Stamens less than 5:
      3. Trees or large scandent shrubs ... *Dalbergia.*
      3. Slender, herbaceous climbers ... *Abrus.*

2. Stamens 10, connate or free, but not 9 + 1 :

4. Trees :
5. Pods winged along sutures ... *Derris.*
5. Pods not winged :
6. Pods thin, flat & oblong, not woody ... *Dalbergia.*
6. Pods woody, obliquely oblong ... *Pongamia.*
4. Erect shrubs or undershrubs ... *Desmodium.*

4. Herbs :
7. Twiners or climbers ... *Clitoria.*
7. Erect herbs ... *Crotalaria.*
7. Small, trailing herbs (sometimes prostrate or diffuse ... *Desmodium*

4. Climbing shrubs :
8. Pods few-seeded, up to 7·5 cms. long :
9. Leaflets distinctly alternate ... *Dalbergia.*
9. Leaflets opposite ... *Derris.*
8. Pods many-seeded (more than 4 seeds), over 7·5 cms. long :
10. Style bearded below the stigma ... *Clitoria.*
10. Style not bearded below the stigma :
11. Leaflets 11–15 ... *Milletia.*
12. Leaflets 3–6 ... *Canavallia.*

2. Stamens 10, diadelphous (i.e. 9 + 1)
12. Trees :
13. Leaves trifoliate ... *Ougenia*
13. Leaves 5–9–foliate ... *Pongamia*

12. Erect shrubs or undershrubs :
14. Bracts large, 12—24 mm. long, usually broader than long ... *Flemingia.*
14. Bracts small and narrower than long ... *Desmodium.*

12. Climbing shrubs :
15. Leaflets 3 ... *Cylista.*
15. Leaflets 5—9 ... *Derris.*
15. Leaflets 11—15 ... *Milletia.*

12. Herbs :
16. Erect ... *Melilotus*
16. Trailing or prostrate ... *Desmodium.*
16. Climbing or twining ... *Clitoria.*

1. *Flowers orange or salmon-coloured* ... *Butea.*

1. *Flowers yellow:*
17. Stamens 9, or at least less than 10 ... *Dalbergia.*
17. Stamens in two bundles of 5 each (i.e. 5 + 5) :
18. Trees ... *Pterocarpus.*
18. Herbs or small shrubs :
19. Pods variously twisted, enclosed in calyx ... *Smithia.*
19. Pods straight, exerted from calyx ... *Aeschynomene.*
17. Stamens 10, connate or free, but not 9 + 1 :
20. Large trees ... *Pterocarpus.*
20. Large, woody climbers ... *Milletia.*
20. Erect shrubs or undershrubs :
21. Leaflets 15—15 ... *Sophora*

21. Leaflets 1—7 :
    22. Seed 1 ; leaves trifoliate ... *Psoralea.*
    22. Seeds usually many ; when seed only 1, leaves often simple ... *Crotalaria.*

20. Herbs (erect, prostrate or climbing) :
    23. Anthers uniform :
        24. Leaflets 4 ... *Geissaspis.*
        24. Leaflets 3 ... *Rothia.*
    23. Anthers dimorphous :
        25. Leaves 2-foliate ... *Zornia.*
        25. Leaves not 2-foliate :
            26. Pods flattened ... *Heylandia.*
            26. Pods turgid ... *Crotalaria.*

17. Stamens diadelphous, i.e. 9 + 1 ;
    27. Climbing shrubs :
        28. Leaves gland-dotted beneath :
            29. Seeds 3 or more :
                30. Corolla up to 18 mm. long ; pods with deep lines between the seeds ... *Atylosia.*
                30. Corolla 25 mm. or longer ; pods with faint lines between the seeds ... *Dumbaria.*
            29. Seeds 1—2 :
                31. Calyx teeth accrescent ... *Cylista.*
                31. Calyx teeth not accrescent ... *Rhynchosia.*
        28. Leaves not gland-dotted beneath :
            32. Leaflets 11—15 ... *Milletia.*
            32. Leaflets 4—5 ... *Mucuna.*
    27. Erect shrubs or undershrubs :
        33. Leaflets 7—11 ... *Indigofera.*
        33. Leaflets 15—50 ... *Sesbania.*
        33. Leaflets 3 :
            34. Seeds 8—10 ... *Phaseolus.*
            34. Seed 1 :
                35. Leaves under 7.5 cms. long ... *Psoralea.*
                35. Leaves 7·5 to 18 cms. long ... *Desmodium.*
            34. Seeds 2—3 :
                36. Lateral leaflets distinctly oblique ... *Desmodium.*
                36. Lateral leaflets not or very slightly oblique ... *Atylosia.*
    27. Herbs :
        37. Leaves simple ... *Tephrosia.*
        37. Leaflets 15—20 pairs ... *Sesbania.*
        37. Leaflets 3 :
            38. Pods 25 mm. or more in length :
                39. Diffuse, prostrate or erect ... *Phaseolus.*
                39. Twining or climbing :
                    40. Style bearded below the stigma ... *Phaseolus.*
                    40. Style not bearded below the stigma :
                        41. Leaves gland-dotted beneath :
                            42. Ovules 3 or more ... *Atylosia.*
                            42. Ovules 2—1 ... *Rhynchosia.*
                        41. Leaves not gland-dotted beneath ... *Dunasia.*

38. Pods under 25 mm. long :
43. Erect herbs ... *Melilotus.*
43. Prostrate or diffuse herbs ... *Trigonella.*
43. Trailing or twining herbs ... *Rhynchosia.*

1. *Flowers pink, purple, violet, blue or lilac* :
44. Erect trees :
45. Leaflets 17—23 ... *Mundulea.*
45. Leaflets 3—15 (generally 4—7) :
46. Leaflets distinctly alternate ... *Dalbergia.*
46. Leaflets opposite ... *Pongamia.*
45. Leaflets 3 :
47. Trunk armed with conical prickles ... *Erythrina.*
47. Trunk unarmed :
48. Flowers rose-coloured, pods 3 — 7·5 × 1,6—2·5 cms. ... *Ougeinia.*
48. Flowers orange or salmon coloured ; pods 12—30 × 2·5—5 cms. ... *Butea.*
44. Climbing shrubs :
49. Leaflets 5—7 :
50. Leaflets distinctly alternate ... *Dalbergia.*
50. Leaflets opposite ... *Derris.*
49. Leaflets 9–21 :
51. Leaflets distinctly alternate ... *Dalbergia.*
51. Leaflets opposite :
52. Leaves abruptly pinnate ... *Abrus.*
52. Leaves imparipinnate ... *Derris.*
49. Leaflets 3 :
53. Leaves gland-dotted beneath ... *Dunbaria.*
53. Leaves not gland-dotted beneath :
54. Style bearded below the stigma :
55. Pods subterete ... *Vigna.*
55. Pods flattened ... *Dolichos.*
54. Style not bearded :
56. Stamens monadelphous :
57. Pods with silky, long brown hairs. *Pueraria.*
57. Pods more or less glabrous ... *Canavallia.*
56. Stamens diadelphous :
58. Petals very unequal ... *Mucuna.*
58. Petals equal :
59. Flowers small, panicled ... *Spatholobus.*
59. Flowers large racemose ... *Butea.*
44. Erect shrubs or undershrubs :
60. Stamens connate or free, 10 ... *Taverniera.*
60. Stamens 9 + 1, diadelphous :
61. Shrubs armed with auxiliary spines ... *Alhagi.*
61. Unarmed shrubs :
62. Leaves 1— and 3—foliate on the same plant ... *Desmodium.*
62. Leaves unifoliate or simple :
63. Bracts 18 mm. long, broader than long ... *Flemingia.*
63. Bracts linear or subulate ... *Desmodium.*

62. Leaves trifoliate :
  64. Pods over 5 cms. long ... *Phaseolus.*
  64. Pods less than 5 cms. long :
    65. Pods distinctly jointed. *Desmodium.*
    65. Pods not clearly jointed :
      66. Pods turgid ... *Pycnospora.*
      66. Pods flattened ... *Pseudarthria.*

62. Leaflets 3—21 :
  67. Pods distinctly jointed, joints folded on one another ... *Craria.*
  67. Pods flattened, continuous or scarcely septate ... *Tephrosia.*
  67. Pods turgid, cylindric, septate ... *Indigofera.*

44. Herbs :
  68. Erect, prostrate or diffuse, but not climbing :
    69. Stamens in two bundles of 5 each ... *Smithia.*
    69. Stamens connate or free, but not 9 + 1 :
      70. Leaves simple :
        71. Stem and branches glandular ... *Psoralea.*
        71. Stem and branches more or less hairy, but not glandular ... *Crotalaria.*
      70. Leaves trifoliate :
        72. Pods thick, fleshy, subtetragonal ... *Cyamopsis.*
        72. Pods narrow, linear, flattened ... *Kothia*
      70. Leaves 5-foliate ... *Clitoria.*
  68. Stamens 9 + 1 :
    73. Leaflets 2 ... *Lathyrus.*
    73. Leaflets 1 and 3 on the same plant :
      74. Joints of pods turgid ... *Alysicarpus.*
      74. Joints of pods flattened ... *Desmodium*
    73. Leaves simple :
      75. Anthers apiculate ... *Indigofera.*
      75. Anthers not apiculate :
        76. Pods one-seeded ... *Psoralea.*
        76. Pods many-seeded :
          77. Pods turgid ... *Alysicarpus*
          77. Pods flattened :
            78. Pods continuous or scarcely septate, dehiscent ... *Tephrosia.*
            78. Pods jointed, separating into indehiscent joints ... *Desmodium*
    73. Leaflets 3—21 :
      82. Anthers apiculate ... *Indigofera.*
      82. Anthers not apiculate : ...
        83. Flowers in leaf-opposed or terminal racemes ... *Tephrosia.*
        83. Flowers in axillary, 2-flowered racemes ... *Clitoria.*
  68. Climbing or twining.
    84. Leaves 1-foliate ... *Grona.*

84. Leaves with more than 3 leaflets :
  85. Corolla uniform in colour, 6 mm.long ... *Glycine*.
  85. Corolla blue with orange centre 3·5–5 cms. long ... *Clitoria*

84. Leaves trifoliate :
  86. Style bearded below the stigma ... *Vigna*.
  86. Style not bearded below the stigma :
    87. Stamens monadelphous :
      88. Alternate anthers sterile, very small ... *Terammus*.
      88. Anthers uniform :
        89. Corolla under 6-mm. long ... *Glycine*.
        89. Corolla over 2·5 cms. long ... *Canavallia*.
    87. Stamens diadelphous :
      90. Anthers dimorphous ... *Mucuna*.
      90. Anthers uniform :
        91. Calyx teeth distinct ... *Shuteria*.
        91. Calyx teeth not distinct ... *Galactia*