

Nodal anatomical study in some Rubiaceae

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Abstract

Anatomies of the nodes belonging to 20 species 11 genera of the family Rubiaceae are investigated. Of these, 16 species exhibited trilacunar, three-traced supply to the leaves. In case of *Canthium coromandelicum*, *Gardenia latifolia*, *G. longistyla*, the nodes show five-lacunar, five-traced supply. In *Luculia gratissima*, they are unilacunar, one-traced. Variation in emergence of median and lateral traces however, is observed. It is the median trace that departs first in 15 species; whereas in the rest others lateral traces emerge earlier, except *Luculia gratissima* wherein the node being unilacunar, one-traced only. The stipule usually receives vascular supply from the lateral traces. However in *Luculia gratissima*, it is the solitary trace that bears vascular supply to them. The present authors are inclined to regard the unilacunar, one-traced supply basic for the family Rubiaceae, whereas others are thought later attainments.

Keywords: Nodal anatomy, Rubiaceae.

INTRODUCTION

Nodal anatomy of the family Rubiaceae has been investigated in past (cf. Sinnott, 1914; Sinnott and Bailey, 1914; Mitra, 1948; Majumdar and Pal, 1958a, 1958b, 1959; Pal, 1959; Howard, 1970; Rao *et.al.* 1971; Neubauer, 1981; Sisode and Patil, 2004). There are, however, many rubiaceous taxa uninvestigated nodal anatomically. The present authors extended more observations on such hitherto unstudied taxa, the result of which is being communicated in this paper.

MATERIALS AND METHODS

The plant materials were collected from different places of India like Tropical Botanic Garden and Research Institute, Palode, Thiruvanthapuram District (Kerala); Forest Research Institute, Peechi, Trichur (Kerala); Calicut University, Botanical Garden (Kerala); Government Botanic Garden, Ootacamund (Tamilnadu); Lal Bag Botanic Garden, Bangalore (Karnataka), and Morkaranja and Charanmal, District Dhule (Maharashtra). The collected materials were preserved in F.A.A. solution, and then permanently preserved in (70%) alcohol. Free hand serial successive transections of nodal region were taken. They were stained in safranin (1%) and fast green (1%) combination. The stained sections were mounted in 50% glycerin and sealed with nail paint.

The magnifications of the eyepieces used 5X, objectives 5X. The line sketches were drawn using prismatic type of camera lucida. These sketches were inked by using Camligraph or Rotring isographs technical inking pens with 0.1, 0.2, 0.3 points.

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Abbreviations

AB: Axillary bundle, L: Lateral trace, M: Median trace.

OBSERVATIONS

The present authors studied nodal anatomy of 20 species belonging to 11 genera of the family Rubiaceae for the sake precision, the observations are tabulated in the Table- I.

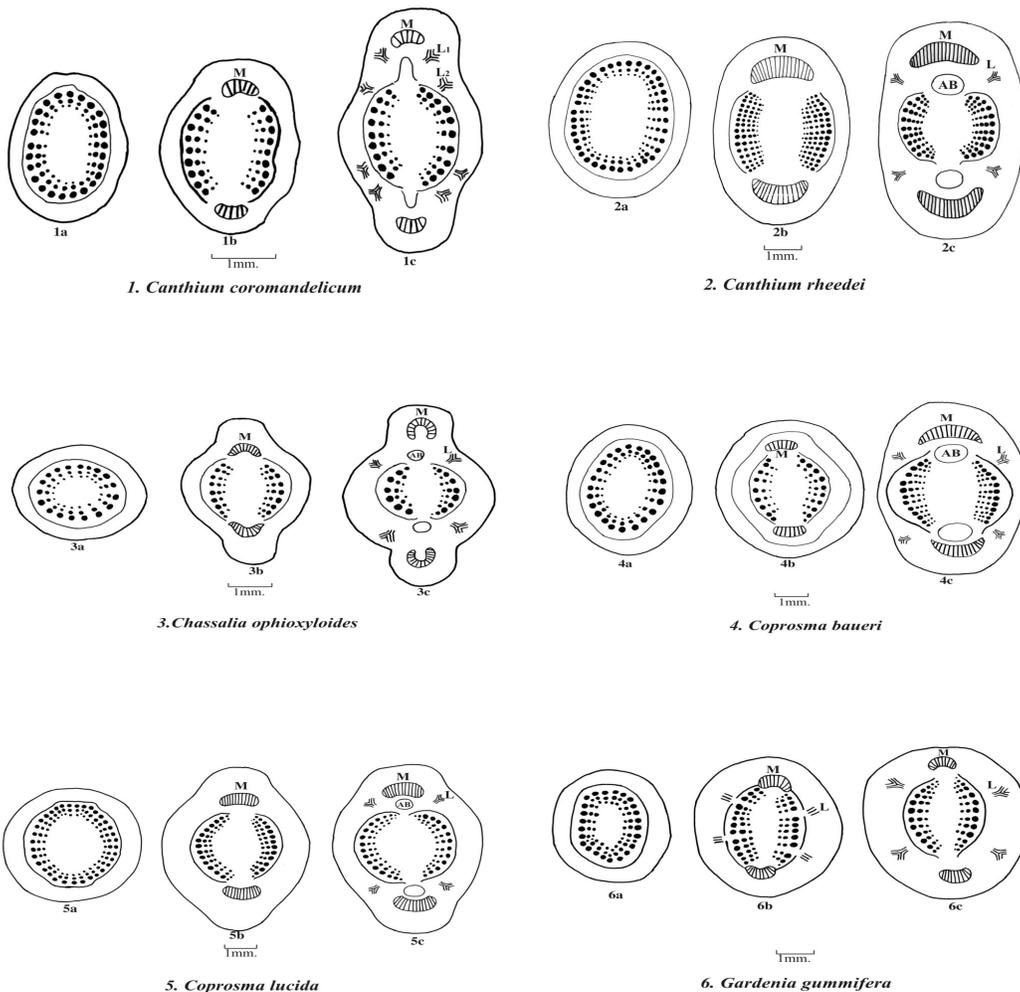
Discussion

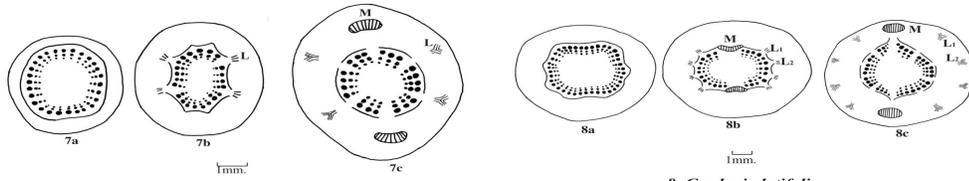
For the present contribution, the authors investigated 20 rubiaceous species belonging to eleven genera nodal anatomically. The taxa investigated revealed unilacunar, one-traced, trilacunar, three-traced and pentalacunar, five-traced supply to the leaves. Unilacunar, one-traced condition is observed only in *Luculia gratissima*, whereas pentalacunar, five-traced supply is noted in case of *Canthium coromandelicum*, *Gardenia latifolis* and *G. longistyla*. Majority of rubiaceous species however, exhibit trilacunar, three-traced condition. Various views have been advanced to interpret the primitivity of nodal structure. Unilacunar, one-traced; unilacunar, two-traced, trilacunar, three-traced, multilacunar, multi-traced, etc. have been conceived primitive by different authors (cf. Sinnott and Bailey, 1914; Marsden and Bailey, 1955; Takhtajan, 1969; Canright, 1955; Bailey, 1956; Ozenda, 1949; Benzig, 1967; etc.) Investigation on nodal anatomy by earlier authors (cf. Sinnott, 1914; Sinnott and Bailey, 1914; Mitra, 1948; Majumdar and Pal, 1958a, 1958b, 1959; Pal, 1959; Howard, 1970; Rao *et al.* 1971; Neubauer, 1981, Sisode and Patil, 2004) and taxa of the present account indicate that unilacunar, one-traced condition appears basic, whereas the other types viz., trilacunar, three-traced and pentalacunar, five-traced ones are later attainments. Sisode and Patil, 2004) while studying junvenile nodes of the Rubiaceae reached to the similar conclusion. The leaves in the Rubiaceae are usually stipulate. Especially interpetiolar stipules are present. They receive vascular supply generally from the lateral traces from the nodes. However, in case of unilacunar, one-traced nodes, it is obtained from the solitary

(median) vascular trace. In general, it is the median trace that emerges first. There are few taxa in which the lateral traces depart first e.g. *Gardenia gummifera*, *G. jasminoides* and *G. latifolia*.

Table 1.

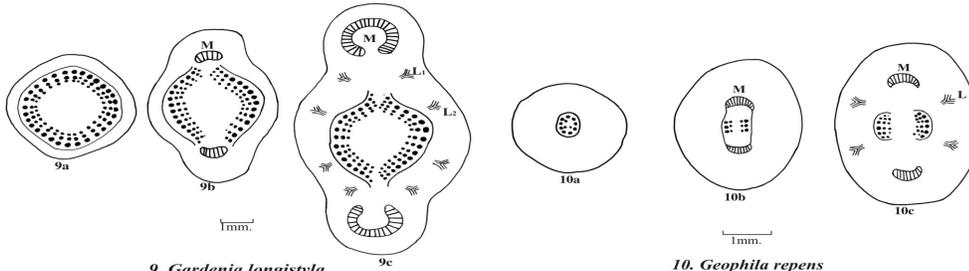
Sr. No.	Plant Name	Basic Vascular Supply		Emergence of Median / Lateral Earlier	Source of Stipular Supply	Figures
		La= Lacuna	T= Trace			
1	<i>Canthium coromandelicum</i> (Burm. f.) Alston	5 La	5 T	Median	Lateral	1a, 1b, 1c.
2	<i>Canthium rheedei</i> DC.	3 La	3 T	Median	Lateral	2a, 2b, 2c.
3	<i>Chassalia ophioxylodes</i> (Wall.) Craib	3 La	3 T	Median	Lateral	3a, 3b, 3c.
4	<i>Coprosma baueri</i> Endl.	3 La	3 T	Median	Lateral	4a, 4b, 4c.
5	<i>Coprosma lucida</i> J.R. et G. Forst.	3 La	3 T	Median	Lateral	5a, 5b, 5c.
6	<i>Gardenia gummifera</i> L. f.	3 La	3 T	Lateral	Lateral	6a, 6b, 6c.
7	<i>Gardenia jasminoides</i> Ellis	3 La	3 T	Lateral	Lateral	7a, 7b, 7c.
8	<i>Gardenia latifolia</i> Aiton	5 La	5 T	Lateral	Lateral	8a, 8b, 8c.
9	<i>Gardenia longistyla</i> (DC.) Hook.	5 La	5 T	Median	Lateral	9a, 9b, 9c.
10	<i>Geophila repens</i> (L.) Johnston	3 La	3 T	Median	Lateral	10a, 10b, 10c.
11	<i>Guettarda speciosa</i> L.	3 La	3 T	Median	Lateral	11a, 11b, 11c.
12	<i>Haldina cordifolia</i> (Roxb.) Ridsd.	3 La	3 T	Median	Lateral	12a, 12b, 12c.
13	<i>Hedyotis stylosa</i> R. Br. ex Wight & Arn.	3 La	3 T	Median	Lateral	13a, 13b, 13c.
14	<i>Hymenodictyon orixense</i> (Roxb.) Mabb.	3 La	3 T	Median	Lateral	14a, 14b, 14c.
15	<i>Ixora alba</i> L.	3 La	3 T	Median	Lateral	15a, 15b, 15c.
16	<i>Ixora brachiata</i> Roxb. ex DC.	3 La	3 T	Median	Lateral	16a, 16b, 16c.
17	<i>Ixora finlaysonianana</i> Wall. ex Don	3 La	3 T	Median	Lateral	17a, 17b, 17c.
18	<i>Ixora javanica</i> DC.	3 La	3 T	Median	Lateral	18a, 18b, 18c.
19	<i>Ixora johnsonii</i> Hook. f.	3 La	3 T	Median	Lateral	19a, 19b, 19c.
20	<i>Luculia gratissima</i> (Wall.) Sweet	1 La	1 T	Median	Median	20a, 20b, 20c.





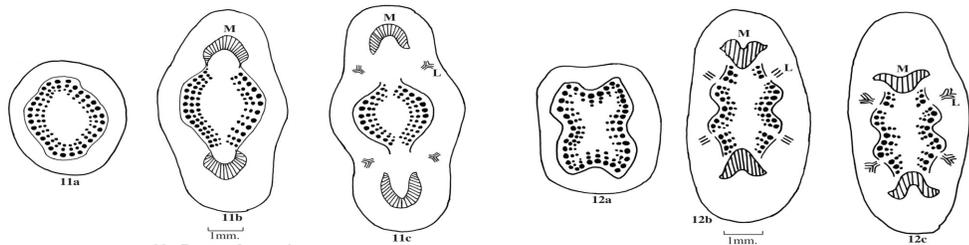
7. *Gardenia jasminoides*

8. *Gardenia latifolia*



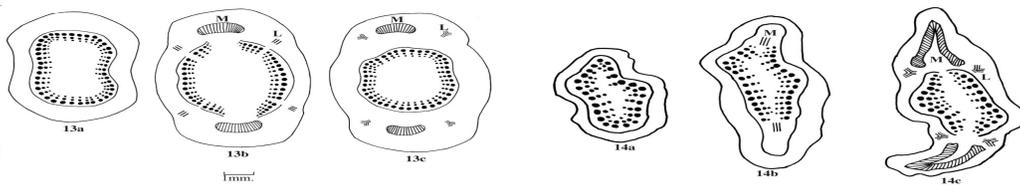
9. *Gardenia longistyla*

10. *Geophila repens*



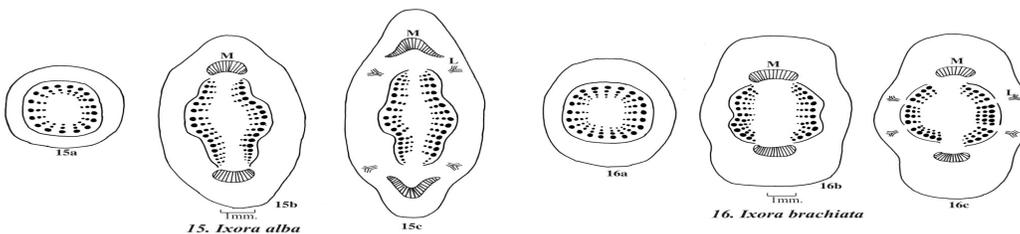
11. *Guettarda speciosa*

12. *Haldina cordifolia*



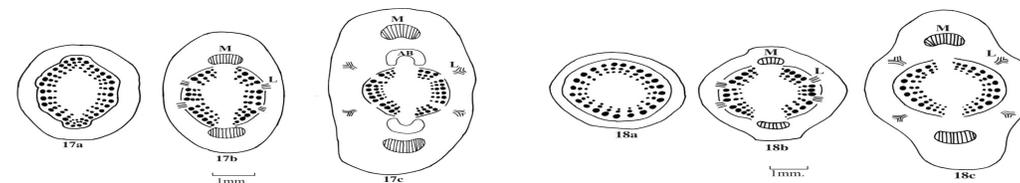
13. *Hedyotis stylosa*

14. *Hymenodictyon orixense*



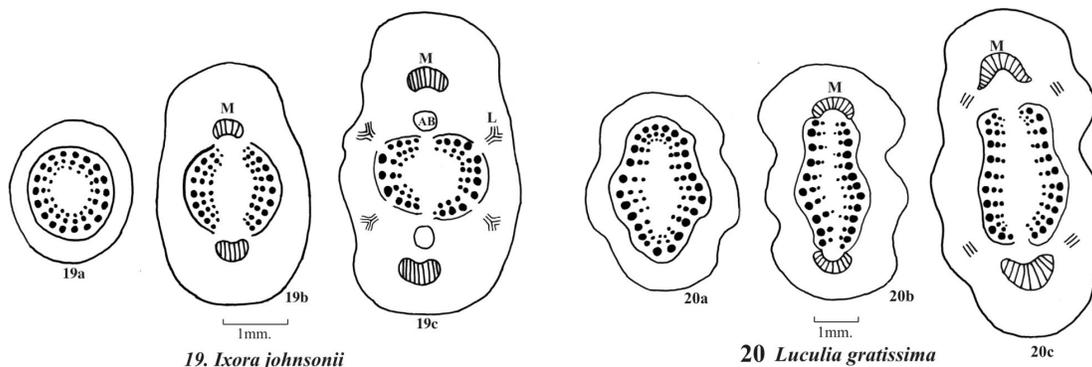
15. *Ixora alba*

16. *Ixora brachiata*



17. *Ixora finlaysoniana*

18. *Ixora javanica*

19. *Ixora johnsonii*20 *Luculia gratissima*

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