ANATOMY OF THE PETIOLE AND PETIOLULE

OBSERVATIONS
Rhus javanica (Fig. 6)

The epidermal cells are small, thick-walled, with a thick cuticle. The epidermis is followed by 2-3-layered collenchymatous hypodermis which becomes even four-layered on the adaxial side, especially in the adaxial groove. Two or more-layered chlorenchyma followed by a narrow band of parenchyma occur next. The parenchyma is succeeded by a generally 2-layered continuous sclerenchymatous ring which encloses the vascular tissue.

The xylem is in the form of a hollow cylinder with a central parenchymatous pith; occasionally, the xylem may bear lateral offshoot. Within the phloem is present a ring of secretory canals. Two prominent canals on the flanks of the petiolarule on the adaxial side occur in the ground tissue, in addition.

Solitary or clustered crystals occur in the pith, phloem, ground tissue and hypodermis.

Rhus mysorensis (Fig. 7)

The petiolarule is nearly cylindrical in outline. The thick-walled epidermis is followed by 3-4-layered collenchyma which in turn is followed by 4-5-layered parenchyma. There is no secretory canal within the ground tissue.
The vascular tissue is in the form of hollow cylinder with central parenchymatous pith. Within the phloem is present a ring of secretory canals. A 3-4-layered ring of sclerenchyma encircles the phloem.

Solitary crystals occur within the ground tissue.

*Rhus parviflora* (Fig. 8)

The petiolule in this species is rather flattened with a shallow median adaxial ridge. The epidermis is of thick-walled cells followed by hypodermal collenchyma. The parenchymatous ground tissue is rather broad and is comprised of several layers.

The vascular tissue is in the form of a hollow cylinder with a central parenchymatous pith. The lignified xylem elements are generally in linear rows. Within the phloem is present a ring of secretory canals. A ring of 2-3 layers of sclerenchyma surrounds the phloem. There are no crystals of whatever kind in this plant.

*Mangifera indica* (Fig. 9)

The epidermis is of thick-walled rather elongated cells with a thick cuticle. There is no hypodermal collenchyma; instead 2-more layers of chlorenchyma are present. The rest
of the ground tissue is parenchymatous with a continuous one-layered ring of sclerenchyma occurring in between and dividing the parenchymatous ground tissue into a narrow outer and broader inner zone.

The xylem is in the form of continuous hollow cylinder with a central pith. The phloem is in small or large patches which are flanked and capped by 2-4-layered sclerenchyma. The sclerenchyma of adjacent flanks is often confluent. Within the phloem are present secretory canals.

There are no crystals of any sort.

_Anacardium occidentale_ (Fig. 10)

The petiole has comparatively thin-walled epidermal cells with a thick cuticle; 2-3 layers of hypodermal chlorenchyma occur in the form of a ring. Within the broad parenchymatous ground tissue are scattered the secretory canals.

The vascular bundles are in a ring and are 10-12 in number. The phloem is capped by sclerenchyma. Secretory canals occur within the phloem. The central pith is of large parenchymatous cells.

There are no crystals of any sort.
**Buchanania axillaris** (Fig. 11)

The petiole is rather flattened with an undulated outline and with a shallow adaxial and prominent abaxial ridges. The epidermis is of small, thick-walled cells with a thick cuticle. It is followed by nearly 3 layers of chlorenchyma followed by a rather loosely arranged parenchymatous ground tissue.

The vascular tissue is of distinct groups of xylem with outer phloem and surrounded by a continuous ring of 3-4 layers of sclerenchyma. Within the phloem are present the secretory canals. Within the central pith also, secretory canals occur.

Clustered crystals occur both within the pith and cortex.

**Buchanania lanzan** (Fig. 12)

The small-celled thick-walled epidermis is followed by a 2 or more-layered chlorenchyma. This is succeeded by unevenly developed few to many-layered collenchyma; one or 2 layers of parenchyma generally follow the collenchyma.

The vascular tissue is in the form of distinct groups adjacent ones of which are often confluent. Within the phloem are present the secretory canals. The phloem is
capped by 2-3-layered sclerenchyma. These patches often laterally extend to give the appearance of a continuous ring. It may also extend in between the bundles so that the ring of sclerenchyma appear ridged and grooved. Often, the secretory canals have the sclerenchyma completely surrounding them. The secretory canals also occur within the pith which is of larger parenchymatous cells.

Clustered crystals occur within the collenchyma.

_Schinus molle_ (Fig. 13)

The thick-walled epidermal cells have thick cuticle as well. The hypodermis is of two-layered chlorenchyma followed by a broad compactly arranged parenchymatous ground tissue. A few-layered sclerenchymatous ring surrounds the central vascular tissue.

The xylem elements of the central ring of vascular tissue are in linear rows. The ring is surrounded by a sclerenchyma ring. The pith is narrow and rather thick-walled. Secretory canals occur in the phloem.

Solitary and clustered crystals occur within the pith and ground tissue.
**Lannea coromandelica** (Fig. 14)

The thick-walled epidermis is followed by a collenchymatous ground tissue of varying number of layers. These extend in between the vascular bundles. Two secretory canals extend along the flanks of petiolute within the collenchyma.

The vascular bundles are 10-12 in number with 1 or 2 secretory canals within the phloem of the bundle. The pith is broad and parenchymatous.

Solitary and clustered crystals occur within the pith and the outer collenchyma.

**Semecarpus anacardium** (Fig. 15)

The epidermal cells are especially thick-walled and have a thick cuticle. This is followed by 2-layered chlorenchyma and 1 or 2-layered collenchyma. The latter occasionally develops flanges which protrude within the parenchymatous ground tissue. On the adaxial side the ground tissue generally contains many secretory canals.

The vascular bundles are many in number with the xylem of adjacent one often confluent. They are arranged in a ring. Within the phloem are present the secretory canals.
The phloem is capped by sclerenchyma which extends laterally and in between the vascular bundles to develop a continuous cylinder. The pith is of compactly arranged parenchymatous cells without crystals. The latter occur only in the ground tissue and are of both solitary and clustered types.

*Holigarna arnottiana* (Fig. 16)

The thick-walled epidermis is followed by collenchymatous ground tissue of varied number of layers. Their number is more especially on adaxial side. Adaxially and on adaxial flanks are present secretory canals surrounded by 2-3 layers of sclerenchyma. Within the collenchymatous ground tissue are present a ring of vascular bundles which are capped with prominent patches of sclerenchyma. Within the phloem are present the secretory canals. The phloem sclerenchyma may sometimes enclose this canal. The pith does contain secretory canals. It is of compactly arranged parenchymatous cells without crystals. The latter occur only in the collenchymatous ground tissue and are of solitary and clustered types. Isolated secretory cells of unknown contents in pith occur.
Spondias pinnata (Fig. 17)

Epidermis is of thick-walled cells with thick cuticle. This is followed by 3-4 layers of chlorenchyma. The rest of the ground tissue is of narrow band of 2-3 layers of parenchyma, a broad 6-7 layers of collenchyma in the middle and an inner zone of 5-6 layers of parenchyma. There is no sclerenchyma delimiting the vascular tissue in this species.

The xylem is in the form of a nearly continuous ring of generally linearly arranged lignified elements. Within the phloem and the central parenchymatous pith are present secretory canals.

Clustered crystals occur within the pith and the ground tissue.
Fig. 6

Rhus javanica L.
Petiolule T.S.
Fig. 7

*Rhus mysorensis* Don.

Petiolule T.S.
Fig. 8

*Rhus parviflora* Roxb.

Petiolule T.S.
Mangifera indica L.
Petiole T.S.
Fig. 10

Anacardium occidentale L.
Petiole T.S.
Fig. 11

*Buchanania axillaris* (Desr) Ramam.

Petiole T.S.
Fig. 12

*Buchanania lanzan* Sprengel.
Petiole T.S.
Fig. 13

_Schinus molle_ L.

Petiolule T.S.
Fig. 14

_Lannea coromandelica_ (Houtt.) Merr.

_Petiolule T.S._
Fig. 15

*Semecarpus anacardium* L.
Petiole T.S.

Co
S.C.
Cr
Sc

1 mm
Fig. 16

*Holigarna arnottiana* Hook.

Petiole T.S.

21.11
Spondias pinnata (L.f.) Kurz. Petiolule T.S.