Short communication

Reinterpretation of the pericarp of *Rhus lancea* (Anacardiaceae)

Irmgard von Teichman
Margaretha Mes Institute for Seed Research, Department of Botany, University of Pretoria, Pretoria, 0002 Republic of South Africa

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The limits of the exo- and endocarp *s.str.* and *s.l.* are defined. In *Rhus lancea* L.f. (tribe Rhoideae) the sclerenchymatous endocarp *s.l.* includes not only the inner stratified, but also the outer ridged part. The exo-, meso- and endocarp of *R. lancea* are briefly compared with homologous parts of the pericarp in five species of the tribe Spondieae. In the Anacardiaceae pericarp structure is of considerable taxonomic significance, particularly at the generic level. There is a need for more ontogenetic studies in this family to enable the comparison of homologous structures in the various taxa.

Die begrippe ekso- en endokarp *s.str.* en *s.l.* word gedefinieer. By *Rhus lancea* L.f. (tribus Rhoideae) sluit die sklerenchimatisie endokarp *s.l.* nie net die binneste gestratifieerde deel nie, maar ook die buitenste gerifte deel. Die ekso-, meso- en endokarp van *R. lancea* word kortlik met homoloë dele van die perikarp van vyf spesies van die tribus Spondieae vergelyk. By die Anacardiaceae is die perikarp-struktuur van groot taksonomiese waarde, veral op generiese vlak. Daar is 'n behoefte aan meer ontogenetiese ondersoekie by hierdie familie om die vergelyking van homoloë strukture tussen verskillende takson moontlik te maak.

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Previously published and generally accepted interpretations of the exo-, meso- and endocarp of drupes in general (Esau 1977; Roth 1977; Fahn 1982) agree in the following: the exo- and endocarp can be considered either *sensu stricto*, i.e. developing only from the cells of the outer and inner epidermis of the ovary wall or also their direct derivatives respectively, or *sensu lato*, i.e. developing from these epidermal layers and adjacent subepidermal layers or regions of the ovary wall. The mesocarp which is generally composed of parenchyma which may be partly or wholly radially elongated, then takes up the part of the pericarp between the exo- and endocarp. The exocarp and endocarp are frequently interpreted as functional units, i.e. the peel of the drupe and the wall of the stone respectively. Vascular bundles may occur in the parenchymatous or fleshy mesocarp or in the endocarp which is usually stony.

The ontogeny and structure of the pericarp of *Rhus lancea* L.f., a member of the tribe Rhoideae of the Anacardiaceae, was published by von Teichman & Robbertse (1986a). Similar studies on *Sclerocarya Hochst.*, *Lannea A. Rich.* and *Harpephyllum Bernh.* ex Krauss, all members of the tribe Spondieae of the Anacardiaceae, contributed towards the knowledge of pericarp structure in this family (von Teichman & Robbertse 1986b; von Teichman 1987; von Teichman & van Wyk 1988). A recent doctoral dissertation (von Teichman und Logischen 1988) included structural data of the pericarp of two additional taxa of the Spondieae, namely *Operculicarya decaryi* H. Perr. and *Tapirira guianensis* Aubl. *subsp. guianensis*, as well as an extensive review of the pericarp of the Anacardiaceae. Observations during the latter study have again emphasized that in a comparison of the pericarp of members of the various tribes of this family, it is crucial that only homologous structures be compared.

Detailed ontogenetic studies on several members of the Anacardiaceae have rendered untenable our previous interpretation of the pericarp structure of *R. lancea* (von Teichman & Robbertse 1986a). It is the purpose of this note to supply an amended interpretation of the pericarp structure of this species and to compare it in broad outline with the pericarp of the previously mentioned genera of the Spondieae.

The exocarp of *R. lancea* consists of the outer epidermis, a sclerenchymatous hypoderms and may include remnants of the underlying parenchyma cells in some parts. This constitutes a functional unit and an exocarp *s.l.*. It was previously published as such (von Teichman & Robbertse 1986a). In comparison, the exocarp of the five members of the Spondieae is relatively thick (Figure 1), comprising the outer epidermis and up to about 20 subepidermal layers of parenchyma or collenchyma. In all these taxa this exocarp *s.l.* originates from the outer epidermis and partially or wholly the outer parenchyma zone of the ovary wall (Figure 1).

The endocarp of *Rhus lancea*, interpreted *s.l.* and as a functional unit, consists of a four-layered inner part, composed of layers of macrosclereids, osteosclereids, brachysclereids and crystal cells, and a ridged outer part. The inner part originates from the inner epidermis of the ovary wall (Figure 1) and was previously described as comprising the endocarp *s.str.*. The outer endocarp consisting mainly of brachysclereids and associated vascular bundles originates from the inner parenchyma zone and parenchyma zone with associated vascular tissue of the ovary wall.

The pericarp of *Operculicarya decaryi* is very similar to that of *Lannea discolor* (Sond.) Engl. The homologous endocarp of *Lannea*, *Sclerocarya* and *Operculicarya* constitutes a heterogenous sclerocarp *sensu Roth* (1977) consisting of fibres and sclereids. In *Harpephyllum* the endocarp is very complex since it comprises spongy and woody tissues (von Teichman & van Wyk 1988). The relatively thin endocarp of *Tapirira guianensis* *subsp. guianensis* (Figure 1) consists of about four layers of brachysclereids and closely associated vascular bundles surrounded by tanniniferous parenchyma. Figure 1 depicts the relative thickness and origin of the homologous endocarp of these five members of the Spondieae.

The mesocarp in all species under discussion comprises the usually parenchymatous, i.e. sometimes
Figure 1 A diagrammatic representation of the ovary wall and pericarp of the different genera of the Spondieae and Rhus lancea (Rhoideae). The ovary wall of all the taxa comprises from the outside to the inside: oe – outer epidermis; o.pa – outer parenchyma zone; mi – mesocarp initials; pa + vt – parenchyma zone with vascular tissue; i.pa – inner parenchyma zone; ie – inner epidermis. In the pericarp the relative thickness and the origin of the homologous parts are shown: en – endocarp, ex – exocarp; me – mesocarp.

includes amongst others, Toxicodendron Mill. and Rhus sect. Venenatae Engl. For R. verniciflua DC., R. glabra L. and several species of the subgenus Toxicodendron, a sclerenchymatous inner mesocarp has been described (Brizicky 1963). However, the latter most probably conforms to the outer endocarp s.l. described here.

Since endocarp structure is genetically stable, it represents a very valuable diagnostic feature. Therefore, this note calls for more ontogenetic pericarp studies in the Anacardiaceae since these provide more meaningful data for comparative purposes. This will ensure that only homologous parts of the pericarp be considered for the solving of taxonomic problems and the elucidation of evolutionary relationships.

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References


