

Actinidiaceae

Number of species, worldwide and in Europe

The north temperate Actinidiaceae family includes 3 genera with 355 species. Endemic species are absent in Europe. *Actinidia deliciosa* is frequently cultivated in Europe.

Analyzed material

The xylem and phloem of 1 genus with 2 species are analyzed here.

Life forms analyzed:	Studies from other authors:	
Lianas	2	3 genera
Plants analyzed from different vegetation zones:	Studies from other authors:	
Hill and mountain	2	

Analyzed species:

Actinidia deliciosa (A.Chev.) C.F.Liang & A.R.Ferguson

Actinidia kolomikta (Rupr. & Maxim.) Maxim.



Actinidia kolomikta (photo: Enking)



Actinidia deliciosa



Actinidia kolomikta (photo: Nicolas)

Characteristics of the xylem

Annual rings occur in both species (**Figs. 1 and 2**). Ring boundaries of the diffuse-porous species are represented by a zone of thicker-walled, flat latewood fibers. (**Figs. 1 and 2**). Vessel diameter varies from 150-300 μm (**Figs. 1 and 2**). Vessel walls are perforated by very distinct scalariform pits but no perforations were found (**Fig. 3**). Perforations of *Actinidia kolomikta* are scalariform with >15 bars and vessel walls have round pits. Vessel density varies from 50-80/mm² (**Figs. 1 and 2**). Intervessel pits are bordered, large and round. Vessel-ray pits are small, round

and arranged in horizontal lines (**Fig. 4**). Fibers are thin- to thick- or thick-walled (**Figs. 1 and 2**). Fibers are characterized by bordered pits with a diameter of 3-6 μm . Axial parenchyma is apotracheal in aggregates (**Fig. 5**).

Rays occur in two forms (ray-dimorphism): uniseriate and 3-5-seriate (**Fig. 6**). Rays are heterogeneous with 2 to >4 square or upright cells (**Fig. 7**).

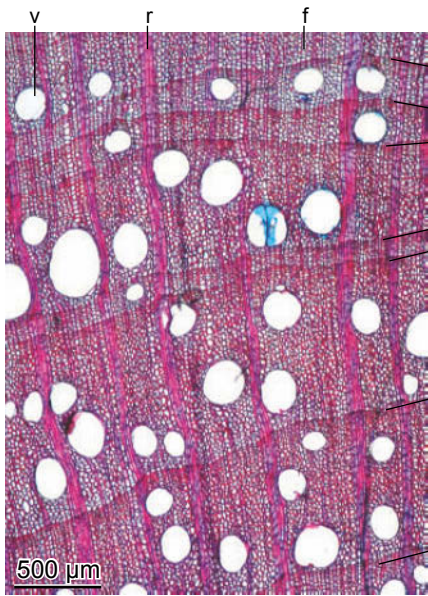


Fig. 1. Diffuse-porous wood with distinct rings. Ring boundaries are characterized by slightly flattened fibers. Stem of a 4 m-long liana, hill zone, temperate climate, Botanical Garden Zurich, Switzerland. *Actinidia deliciosa*, transverse section.

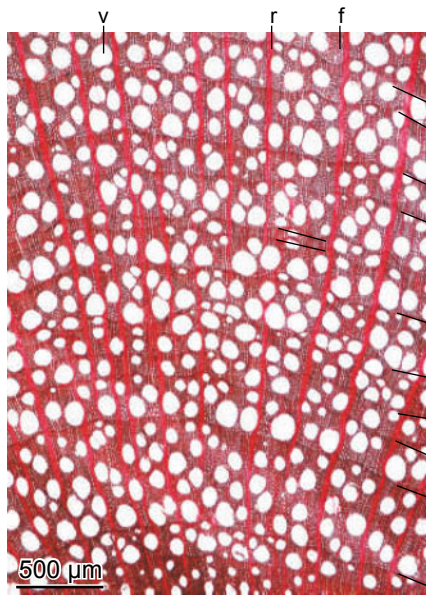


Fig. 2. Diffuse-porous wood with distinct rings. The ring-boundaries are characterized by a band of flattened fibers. Stem of a 4 m-long liana, boreal zone, temperate climate, Botanical Garden Chabarovsk, Russia. *Actinidia kolomikta*, transverse section.

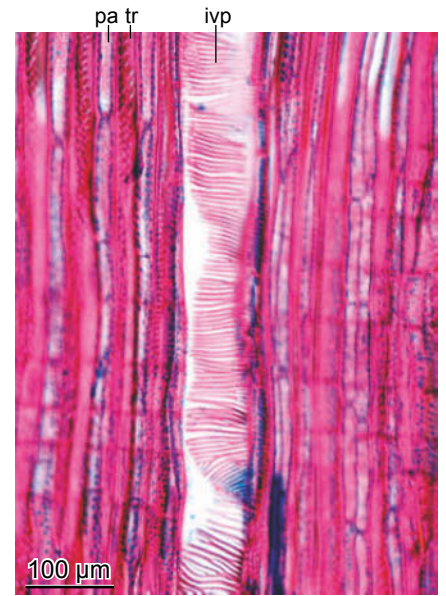
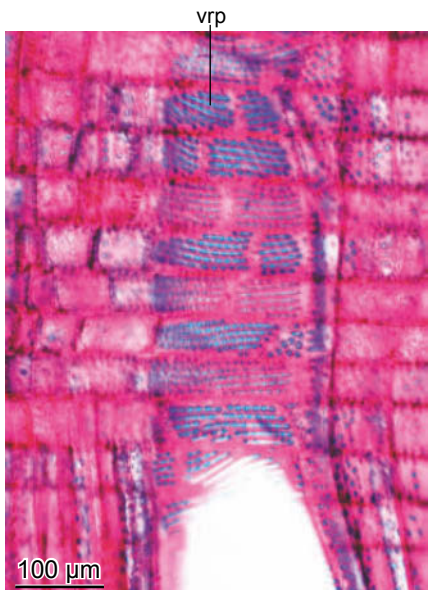
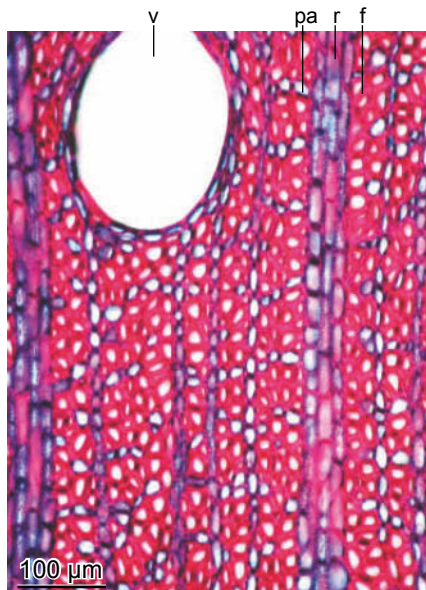


Fig. 3. Scalariform perforations all along the vessel. Perforations are absent. Origin as in **Fig. 1**. *Actinidia deliciosa*, radial section.



Left Fig. 4. Small ray-vessel pits arranged in horizontal lines. Origin as in **Fig. 1**. *Actinidia deliciosa*, radial section.



Right Fig. 5. Apotracheal parenchyma in aggregates. Origin as in **Fig. 1**. *Actinidia deliciosa*, transverse section.



Left Fig. 6. Rays of different sizes: uniseriate and 3-5-seriate. Origin as in **Fig. 1**. *Actinidia deliciosa*, tangential section.

Right Fig. 7. Heterogeneous ray with >4 rows of square and upright marginal cells. Origin as in **Fig. 1**. *Actinidia deliciosa*, radial section.

Characteristics of the phloem and the cortex

The phloem is fairly homogeneous in most cases. Parenchyma cells and sieve tubes are often/typically difficult to distinguish in cross-section. Irregularly distributed groups of sclereids, mucilage canals and very long, raphid-like prismatic crystals exist in the phloem of *Actinidia deliciosa* (**Figs. 8 and 9**).

Ecological trends and relations to life forms

Vessels with large diameters are characteristic of the liana life form.

Discussion in relation to previous studies

The genera *Actinidia* has been described in several previous studies (GREGORY 1994). The present observations of *Actinidia* correspond closely/for the most part with those from METCALFE AND CHALK (1957).

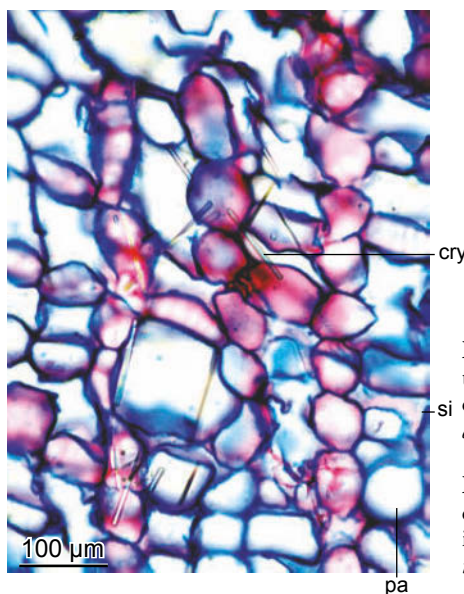
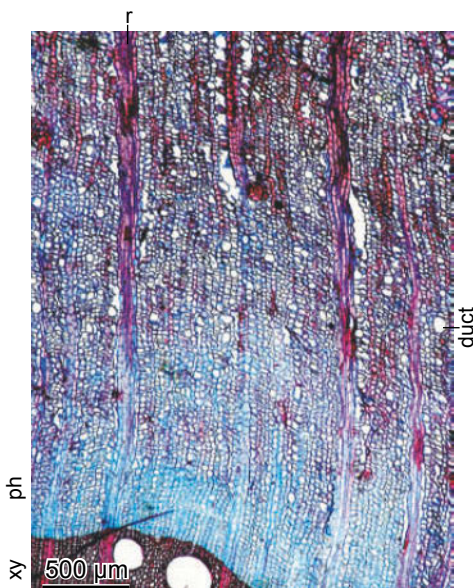


Fig. 8. Phloem with mucilage canals. Sieve tubes and parenchyma cells are difficult to differentiate. Origin as in **Fig. 1**. *Actinidia deliciosa*, transverse section.

Fig. 9. Phloem with roundish parenchyma cells and square sieve tubes. Crystals occur in raphid-like form. Origin as in **Fig. 1**. *Actinidia deliciosa*, transverse section.

Present features in relation to the number of analyzed species		
IAWA code		frequency
Total number of species		2
1	growth rings distinct and recognizable	2
5	diffuse-porous	2
9	vessels predominantly solitary	2
14	vessels with scalariform perforation plates	2
20	intervessel pits scalariform	1
22	intervessel pits alternate	2
42	earlywood vessels: tangential diameter 100-200 µm	2
50	<100 vessels per mm ² in earlywood	2
56	tylosis with thin walls	2
62	fiber pits large and distinctly bordered	
	(>3 µm = fiber tracheids)	2
70	fibers thin- to thick-walled	2
76	parenchyma apotracheal, diffuse in aggregates	2
98	rays commonly 4-10-seriate	2
103	rays of two distinct sizes (tangential section)	2
107	ray: heterocellular with 2-4 upright cell rows	
	(radial section)	2
108	ray: heterocellular with >4 upright cell rows	
	(radial section)	2
R4	sclereids in phloem and cortex	1
R10	phloem not well structured	1
R11	with raphides	1
R12	with laticifers, oil ducts or mucilage ducts	1
R16	phellem consists of regularly arranged rectangular cells,	
	Rosaceae type	1

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