

# Hedyosmum orientale MERR. et CHUG (センリョウ科)の材解剖

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## Akira TAKAHASHI\* : Wood Anatomy of *Hedyosmum orientale* MERR. et CHUN (Chloranthaceae)

高橋 晃\* : *Hedyosmum orientale* MERR. et CHUN (センリヨウ科) の材解剖

*Hedyosmum orientale* MERR. et CHUN is a shrub of the Chloranthaceae with a unique distribution in SE. Asia (S. China, Sumatra, Borneo and Central Celebes), in contrast to other members of this genus (about 35 spp.) which are distributed in the New World from Mexico to Peru and Brazil and the West Indies (VERDCOURT, 1986). Anatomical features of the wood of several species of *Hedyosmum* are known to be rather advanced for this family (SWAMY, 1953; METCALFE, 1987), but further information concerning the wood anatomy is needed. In this paper, the wood anatomy of *H. orientale* is described and anatomical differences and relationships with other members of this family are discussed.

### Material

The specimen of *Hedyosmum orientale* was collected in Padang, West Sumatra, on Aug. 17, 1984 (voucher specimen No. HOTTA et al. 414). The stem is 15 mm in diameter, of which 4 mm is wood.

### Description

Wood diffuse porous. Growth rings invisible. Pores evenly distributed; 35-65 pores per square mm; usually solitary, occasionally in couple or triple radial series; solitary pores polygonal in outline; 30-80 and 30-90  $\mu\text{m}$  in tangential and radial diameters, respectively; thin-walled, 1.5-3  $\mu\text{m}$  thick. Vessel elements 1100-2200 (mean 1713)  $\mu\text{m}$  long; end walls steeply inclined; perforation plates scalariform with more than 80, up to 200 or more bars; spiral thickenings invisible. Intervessel pits rarely observed, scalariform to transitional; pits of lateral walls circular bordered, 4-7  $\mu\text{m}$  in diameter, with oblique lenticular apertures.

Wood fibers 1000-2100 (mean 1715)  $\mu\text{m}$  long; polygonal in cross section, 15-55  $\mu\text{m}$  in diameter;

walls 3-7  $\mu\text{m}$  thick; with simple pits; spiral thickenings invisible; often septate, with one or two septa.

Wood parenchyma rare; paratracheal scanty; crystals invisible.

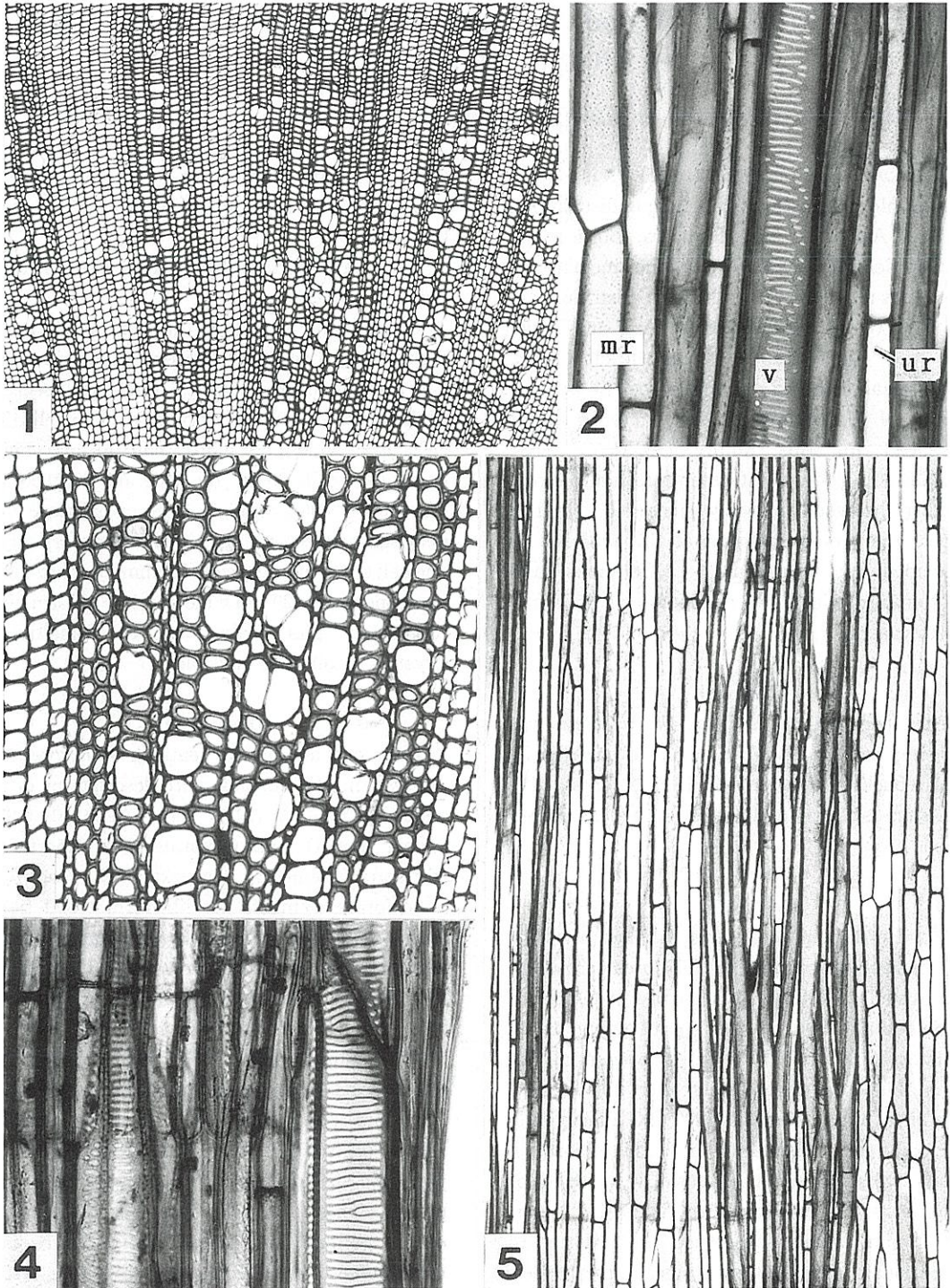
Rays usually very high, uni- or biseriate and multiseriate, consisting entirely of upright cells; 4-8 rays per mm length in tangential section. Multiseriate rays usually primary; 8-16 cells (300-600  $\mu\text{m}$ ) wide and more than 10 mm high; component cells 25-40  $\mu\text{m}$  wide and 80-1050  $\mu\text{m}$  (mostly 200-600  $\mu\text{m}$ ) high. Uni- or biseriate rays disposed between the multiseriate primary rays; one cell (100  $\mu\text{m}$ ) to 60 cells (10 mm) or more high; component cells 20  $\mu\text{m}$  wide and 100-450  $\mu\text{m}$  high. Ray-Vessel pits scalariform to transitional. Crystals or oil cells invisible.

### Discussion

The wood anatomical features of *Hedyosmum orientale* mostly coincide with descriptions of the genus by SWAMY (1953) and METCALFE (1987) except that 1) both perforate and imperforate tracheary elements are extremely long, 2) imperforate elements are libriform wood fibers with simple pits, 3) not only uniseriate rays but also biseriate rays are present, and 4) multiseriate rays and the component cells are very high. The wood has rather primitive characters such as angular solitary pores, long vessel elements and fibers, scalariform perforation plates with many bars, and scalariform intervessel pits, whereas rather specialized ones such as fibers with simple pits and paratracheal parenchyma are also present. These primitive characters are shared by other genera of this family, *Ascarina*, *Chloranthus*, and *Sarcandra* (SWAMY, 1953; TAKAHASHI, 1984; METCALFE, 1987), although *Sarcandra* can not be compared with others because it is vesselless (SWAMY and BAILEY, 1950). The imperforate tracheary elements of this

\*Department of Biology, College of Bio-Medical Technology, Osaka University, Toyonaka, Osaka 560.

〒560 豊中市待兼山町1-1 大阪大学医療技術短期大学部生物学教室



Figs. 1-5. Wood of *Hedyosmum orientale*. 1: Cross section ( $\times 40$ ) showing wide multiseriate rays and diffuse pore distribution. 2: Tangential section ( $\times 170$ ) showing a vessel (v) with scalariform intervessel pits, uniseriate rays (ur), and a multiseriate ray (mr). 3: Cross section ( $\times 120$ ) showing angular solitary pores with thin walls and fibers with thick walls. 4: Radial section ( $\times 190$ ) showing scalariform perforation plates (right side) and scalariform ray-vessel pits (left side). 5: Tangential section ( $\times 50$ ) showing two multiseriate rays.

species are most advanced ones in *Hedyosmum*, which usually has fiber-tracheids with reduced bordered pits, while those of other genera are tracheids or fiber-tracheids with distinctly bordered pits (SWAMY, 1953; METCALFE, 1987). Wood parenchyma is predominantly paratracheal in *Hedyosmum* in contrast with apotracheal parenchyma in other genera (SWAMY, 1953; METCALFE, 1987), although a tendency towards paratracheal parenchyma in *Ascarina* and *Chloranthus* is pointed out by TAKAHASHI (1984, 1985). The ray system of this species may be classified into Heterogeneous Type I (KRIBS, 1935) based on the form and the component cells, as stated by SWAMY (1953). The multiseriate rays, however, are typically wide and high primary rays, which are also characteristic of other shrubby genera *Chloranthus* and *Sarcandra* (METCALFE, 1987) and different from those of arborescent species of *Ascarina* (PATEL, 1975; TAKAHASHI, 1985). It seems that the form of the rays is related to the shrubby habit, as in *Chloranthus* or *Sarcandra*, and the rays are rather specialized, differing from the KRIBS' Heterogeneous Type I. From the view point of wood anatomy, *Hedyosmum* is the most advanced genus in the family and this species has more specialized features than other members of the genus.

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#### References

- KRIBS, D. A. 1935. Salient lines of structural specialization in the wood rays of dicotyledons. *Bot. Gaz.* 96: 547-557.
- METCALFE, C.R. 1987. *Anatomy of the Dicotyledons*. 2nd ed. Vol. III. Magnoliales, Illiciales, and Laurales, pp. 138-146. Clarendon Press, Oxford.
- PATEL, R.N. 1975. Wood anatomy of the dicotyledons indigenous to New Zealand. 10. Chloranthaceae. *N.Z. J. Bot.* 13: 141-148.
- SWAMY, B.G.L. 1953. The morphology and relationships of the Chloranthaceae. *J. Arn. Arb.* 34: 375-408.

— and BAILEY, I.W. 1950. *Sarcandra*, a vesselless genus of the Chloranthaceae. *J. Arn. Arb.* 31: 117-129.

- TAKAHASHI, A. 1984. Comparative wood anatomy of Chloranthaceae. *Proc. Pacific Regional Wood Anatomy Conference*, October 1-7, 1984, Tsukuba, Ibaraki, Japan, pp. 150-152.
- . 1985. Wood anatomical studies of Polycarpicae. I. Magnoliales. *Sci. Rep., Col. Gen. Educ. Osaka Univ.* 34: 29-83.
- VERDCOURT, B. 1986. Chloranthaceae. *In*: C.G.G. L. van STEENIS (ed.), *Flora Malesiana*, ser. I., vol. 10(2), pp. 123-144. Martinus Nijhoff, Hague.

#### 摘 要

*Hedyosmum orientale* MERR. et CHUN (センリョウ科) の材解剖学的記載を行ない、この科の他属との相違や関係について論じた。

この種の材は、管孔は角ばり、通常単独配列である。道管要素は  $1,713 \mu\text{m}$  と長く、多数の横線のある階段状穿孔と階段状の道管間壁孔を有する。繊維細胞は単壁孔を有する真性木繊維で、平均  $1,715 \mu\text{m}$  と長い。木部柔組織は少ないが随伴散在型である。放射組織は単列または二列のものと多列のものがあり、いずれも高い直立細胞からなる。多列放射組織は通常、幅広くて高さの非常に高い一次放射組織である、などの特徴をもつことがわかった。これらのほとんどの特徴はこの属の従来に記載に一致するが、管状要素が極めて長いこと、繊維細胞が真性木繊維であること、放射組織には二列のものがあること、多列放射組織とその構成細胞が極めて高いことが異なっている。

長い管状要素や、階段状穿孔と階段状の道管間壁孔を有する道管要素などの原始的な特徴は、センリョウ科の他属においても共通して見られるものである。真性繊維あるいは退化した有縁壁孔を有する繊維状仮道管と、随伴散在型柔組織とは *Hedyosmum* 属の特徴であり、他属のそれらが仮道管が顕著な有縁壁孔を有する繊維状仮道管および、独立柔組織であるのに対して進んだ特徴である。極めて高い多列放射組織はセンリョウ属やヒトリシズカ属と同様の形態で、灌木であることとの関係で特殊化したものと思われる。

材解剖学的見地から、*Hedyosmum* 属は原始的特徴を数多くもつセンリョウ科のなかでも最も進んだ属であり、その中でこの種はより多くの特殊化した特徴をもっていると言える。

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