Ecological Wood Anatomy of Turkish *Rhododendron* L. (*Ericaceae*). Intraspecific Variation

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Abstract : The intraspecific relationships of selected wood anatomical characters such as altitude, stem diameter, stem age and average annual ring width were investigated in five different Turkish *Rhododendron* L. species. *Rhododendron luteum* Sweet. grows at an altitude of 110 to 2230 m, *R. ungernii* Trautv. 900 to 2020 m, *R. smirnovii* Trautv. 1600 to 2230 m, *R. caucasicum* Pallas 1900 to 3100 m, and *R. ponticum* L. from sea level to 2230 m in the Eastern Black Sea Region. Although the degree of significance varies between species, correlation and multiple regression analysis indicated a significant correlation between wood anatomical characters and non-anatomical factors.

Key Words: Intraspecific variation, wood anatomy, altitude, Rhododendron, Turkey.

Türkiye Orman Güllerinin (*Rhododendron* L.) Ekolojik Odun Anatomisi (*Ericaceae*). Tür Düzeyinde Varyasyonlar

Özet : Türkiye'deki beş *Rhododendron* L. türünün bazı anatomik özellikleri ile rakım, gövde çapı, yaş ve ortalama yıllık halka genişliği ilişkileri tür düzeyinde araştırılmıştır. Doğu Karadeniz Bölgesi'nde; *R. luteum* Sweet. 110-2230 m, *R. ungernii* Trautv. 900-2020 m, *R. smirnovii* Trautv. 1600-2230 m, *R. caucasicum* Pallas 1900-3100 m, *R. ponticum* L. ise deniz seviyesinden 2230 m yükseklikler arasında yetişmektedir. Korelasyon ve çoğul regresyon analizleri sonucunda; türlere göre önem düzeyleri değişmekle birlikte, bazı anatomik özellikler ile anatomik olmayan faktörler arasında anlamlı ilişkiler saptanmıştır.

Anahtar Sözcükler: Tür düzeyinde varyasyon, odun anatomisi, rakım, Rhododendron, Türkiye

Introduction

According to Metcalfe and Chalk (1) *Ericaceae*, particularly *Rhododendron* L. is widely distributed, but species are numerous especially in China and South Africa. *Rhododendron* species are distributed in China, Tibet, Burma, Nepal, New Guinea, Tropical Asia, Europe and North America. There are about 700 species in these regions (2, 3). According to Suzuki (4), the habitats of *Rhododendron* species show a wide range, from low-montane forests to alpine regions more than 4000 m high. These species are usually shrubs and tall trees about 30 m high and 100 cm in diameter in Nepal. In Turkey, the ones distributed from sea level to about 3200 m, are usually large shrubs (*R. ponticum* L., *R. ungernii* Trautv.), shrubs (*R. caucasicum* Pallas). *R. luteum* is deciduous,

and the others are evergreen shrubs. *R. caucasicum* is alpine type, and the others are forest type.

Studies on wood anatomical variation within species are few, and usually did not succeed in finding a correlation between wood structure and non-anatomical factors (5, 6). A significant correlation was found only in studies carried out in a small region, and showed that wood anatomical characters are significantly related with non-anatomical factors (NAF), especially in relation to the altitude (7-9). There are very few studies of intraspecific variation compared with interspecific ones in ecological wood anatomy.

The objective of this study was to examine the intraspecific variation of the wood anatomy of Turkish *Rhododendron*.

Materials and Methods

of Rhododendron species were Wood samples collected in the Eastern Black Sea Region (Artvin and the Firtina Valley) at an altitude of sea level up to 3100 m, with 50 m intervals. The material was sectioned in the usual way, and sections were stained with safranin. Maceration was prepared using Schultze's method (nitric acid and potassium chlorate). The length of libriform fibres, fibre-tracheids and vessel members, and fibre diameters were measured using macerations. The other quantitative data were measured and counted in sections. One sample was studied for a particular altitude at 50 m intervals for 5 species making a total of 176 samples. Each average value is based on 50 measurements and counts. Results of all individuals are compared in relation to different non-anatomical factors (altitude, stem age, stem diameter, ring width). Correlation among these four factors and 26 wood anatomical characters are assessed, and anatomical characters are then evaluated by multiple regression analysis using non-anatomical factors as independent variables. The software used is multivariate general linear hypothesis in SPSS on a IBM PC. All wood terms used conform to the usage of the IAWA Committee on Nomenclature (10).

Voucher number of samples: Rhododendron ungernii; Artvin-Murgul 900 m, KATO 13362 (n. merev [abbreviated as nm from now on] 184); 950 m, KATO 13363 (nm 11); 1000 m, KATO 13364 (nm 186); 1150 m, KATO 13365 (nm 180); 1200 m, KATO 13366 (nm 80); 1300 m, KATO 13367 (nm 179); 1350m, KATO 13368 (nm 178); 1400 m, KATO 13369 (nm 20); 1450 m, KATO 13370 (nm 177); 1550 m, KATO 13371 (nm 174); 1600m, KATO 13372 (nm 172); 1650 m, KATO 13373 (nm 98); 1700 m, KATO 13374 (nm 170); 1770 m, KATO 13375 (nm 85); 1790 m, KATO 13376 (nm 165); 1800 m, KATO 13377 (nm 36); 1900 m, KATO 13378 (nm 166); 2000 m, KATO 13379 (nm 110). R. smirnowii; Artvin-Murgul 1350 m, KATO 13380 (nm 176); 1600 m, KATO 13381 (nm 173); 1620 m, KATO 13382 (nm 163); 1660 m, KATO 13383 (nm 93); 1680 m, KATO 13384 (nm 36); 1700 m, KATO 13385 (nm 83); 1730 m, KATO 13386 (nm 168); 1750 m, KATO 13387 (nm 86); 1770 m, KATO 13388 (nm 84); 1850 m, KATO 13389 (nm 167); 1900 m, KATO 13390 (nm 185); 1970 m, KATO 13391 (nm 108); 2020 m, KATO 13392 (nm 109); 2060 m, KATO 13393 (nm 111); 2230 m, KATO 13394 (nm 112). R. caucasicum;

Artvin-Melo 1900 m, KATO 13395 (nm 38), 1950 m, KATO 13396 (nm 37); 2000 m, KATO 13397 (nm 39); 2050 m, KATO 13398 (nm 199); 2100 m, KATO 13399 (nm 190); 2150 m, KATO 13400 (nm 198); 2200 m, KATO 13401 (nm 188), 2230 m, KATO 13402 (nm 117); 2310 m, KATO 13403 (nm 118); Artvin-Atilla vadisi 2320 m, KATO 13404 (nm 119); 2350 m, KATO 13405 (nm 133); 2380 m, KATO 13406 (nm 120); 2400 m, KATO 13407 (nm 200); 2450 m, KATO 13408 (nm 121), 2500 m, KATO 13409 (nm 46), 2550 m, KATO 13409 (nm 193), 2600 m, KATO 13410 (nm 194); 2650 m, KATO 13411 (nm 192); 2700m, KATO 13412 (nm 135); 2750 m, KATO 13413 (nm 197); 2850 m, KATO 13414 (nm 191), 2950 m, KATO 13415 (nm 195); Kaçkar- Öküz yaylası 3000 m, KATO 13416 (nm 138); 3050 m, KATO 13417 (nm 136); 3100 m, Kato 13418 (nm 137). R. ponticum; Hemşin-Fırtına deresi 5 m, KATO 13419 (nm 139); 50 m, KATO 13420 (nm 141); 100 m, KATO 13421 (nm 142); 140 m, KATO 13422 (nm 47); 250 m, KATO 13423 (nm 145); 380 m, KATO 13424 (nm 150); 450 m, KATO 13425 (nm 151); 490 m, KATO 13426 (nm 153); 550 m, KATO 13427 (nm 62); 600 m, KATO 13428 (nm 63); 650 m, KATO 13429 (nm 64); 750 m, KATO 13430 (nm 43); 800 m, KATO 13431 (nm 49); 850 m, KATO 13432 (nm 66); 900 m, KATO 13433 (nm 67); 980 m, KATO 13434 (nm 68); Artvin-Murgul 1000 m, KATO 13435 (nm 4); 1060 m, KATO 13436 (nm 50); 1080 m, KATO 13437 (nm 69); 1100 m, KATO 13438 (nm 41); 1150 m, KATO 13439 (nm 27); 1200 m, KATO 13440 (nm 90); 1250 m, KATO 13441 (nm 91); 1300 m, KATO 13442 (nm 101); 1370 m, KATO 13443 (nm 72); 1450 m, KATO 13444 (nm 74); 1500 m, KATO 13445 (nm 53); 1650 m, KATO 13446 (nm 159); 1700 m, KATO 13447 (nm 171); 1730 m, KATO 13448 (nm 169);1850 m, KATO 13449 (nm 164); 1970 m, KATO 13450 (nm 107); 2100 m, KATO 13451 (nm 123); 2230 m, KATO 13452 (nm 113).

Results

Wood Anatomical Description

Rhododendron: Wood diffuse-porous (11) (Figure 1), with distinct or indistinct growth rings. Pores evenly distributed without any tendency to a specific pattern, many to numerous (pores/sq. mm), very small to small (tangential diameters); angular, solitary and sometimes in

small radial and tangential multiples (2-5 pores) in crosssection. Vessel elements short with thin walls (1-1.25 μ m), perforation plates mostly scalariform (Figure 5) and sometimes both simple and scalariform (exclusively in R. luteum). Spiral thickening present on the walls of the vessel elements but inconspicuous, usually restricted to ligulate ends. Imperforate tracheary elements intermediate or libriform fibres (few), fibre-tracheids (abundant) and vascular tracheids. Libriform fibres with simple pits (sometimes extremely minute vestige of border observed on pits, sometimes inpitted). Fibretracheids with distinctly bordered pits on the radial and tangential walls. Tracheids, here defined as tracheary elements, resemble narrow vessel elements but lack perforation or only have a single perforation or very reduced perforation. Parenchyma apotracheal-diffuse, very sparse, fusiform and strands of 2-4 cells. Rays heterogeneous I, II (Figure 3) or I (Figure 2), uniseriate and multiseriate. Crystals not observed in ray cells and parenchyma cells.

R. luteum Sweet .: Pores 288-558-1072 /sq. mm, mostly solitary (56-88%), tangential diameter 17-27-43 μm, vessel elements 198-449-764 μm long, perforation plates scalariform with 2-12 bars and simple in oblique end walls, intervessel pits opposite to diffuse, rounded to oval, 2-6 µm in diameter. Libriform fibres 573-774-1176 µm long, 15-20-28 µm wide, 2-7 µm wall thickness; fibre-tracheids 573-627-1123 µm long, 9-18-34 μ m wide, 2-5 μ m wall thickness, tracheids average 480 µm long. Rays heterogeneous I (uniseriate rays composed of upright cells, multiseriate rays composed of a multiseriate central core of procumbent cells, uniseriate wings upright and square cells), uniseriate rays abundant, 9-19-29 rays/mm, average height 517 μ m, multiseriate rays few 1-4-9 rays/mm, 2-8 cells wide and 24-75 μm wide, average height 673 µm. Vessel-ray pits halfbordered, numerous, and alternate a little smaller than intervessel pits.

R. ungernii Trautv.: Pores 176-424-704 /sq. mm, mostly solitary (57-88 %), tangential diameters 15-27-45 μ m, vessel elements 237-521-840 μ m long, perforation plates with 10-17-30 bars, intervessel pits opposite to diffuse. Libriform fibres 596-800-1123 μ m long, 13-20-28 μ m wide, 3-7 μ m wall thickness. Fibretracheids 446-657-955 μ m long, 13-19-28 μ m wide, 2-5 μ m wall thickness. Tracheids average 483 μ m long. Ray heterogeneous I and II (heterogeneous II rays: uniseriate rays composed of upright, square and procumbent cells, wings of multiseriate rays short, of square cells), uniseriate rays abundant, 8-17-25 rays/mm, average 409 μ m height, multiseriate rays few 1-4-11 rays/mm, 2-6 cells wide and 30-78 μ m wide, average 534 μ m height (Table 1).

R. smirnovii Trautv.: Pores 224-472-960 /sq. mm, mostly solitary (48-80 %), tangential diameter 11-26-37 μ m, vessel elements 252-490-756 μ m long, perforation plates with 10-17-25 bars, intervessel pits opposite to alternate and sometimes sparse. Libriform fibres 497-743-1054 μ m long, 13-19-24 μ m wide, 3-7 μ m wall thickness. Fibre-tracheids 382-614-886 μ m long, 11-17-21 μ m wide, 2-5 μ m wall thickness. Tracheids average 459 μ m long. Rays heterogeneous I-II, uniseriate ray 10-17-29 rays/mm, average 383 μ m height, multiserate rays 1-3-7 rays/mm, 2-9 cells wide, 15-88 (m wide and average 485 μ m height (Table 2).

R. caucasicum Pallas: Pores 416-781-1244 /sq. mm, mostly solitary (47-77 %), tangential diameters 7-19-37 μm, vessel elements 175-326-580 μm long, perforation plates with 6-12-22 bars, intervessel pits opposite to Libriform fibres decreased, fibre-tracheids alternate. increased with altitude (about 2300-3100 m), and 405-532-745 μ m long at low altitude (not observed at high altitude), 13-16-22 µm wide, 3-6 µm wall thickness. Fibre tracheids 244-414-764 µm long, 9-14-22 µm wide, 2-5 μ m wall thickness. Tracheids average 318 (m long. Rays heterogeneous I, uniseriate rays 16-23-30 rays/mm, average 423 µm height, multiseriate rays 1-4-14 rays/mm, 2-6 cells wide, 15-50 µm wide, average 547 μ m height, pits to vessels (vessel-ray), numerous and alternate (Table 3).

R. ponticum L.: Pores 176-486-1008 /sq. mm, mostly solitary (48-85 %), tangential diameters 13-26-47 μ m, vessel elements 191-553-802 μ m long, perforations plates with 8-17-27 bars, intervessel pits opposite to diffuse, rounded to oval, sometimes long in horizontal (3-6 μ m). Libriform fibres 519-842-1130 μ m long, 13-19-24 μ m wide, 2-6 μ m wall thickness, fibretracheids 366-678-993 μ m long, 11-18-22 μ m wide, 2-5 μ m wall thickness. Tracheids average 511 μ m long. Rays heterogeneous I, uniseriate rays 11-20-28 rays/mm, average 433 μ m height, multiseriate rays 0-3-8 rays/mm, 2-8 cells wide, average 603 μ m height (Table 4).



Figure 1-5. *Rhododendron*. -1: cross section, *R. smirnovii*, axial parenchyma (short arrow), vessel (long arrow) (KATO 13380). -2: tangential section. *R. ungernii*, uniseriate ray (short arrow) and multiseriate ray (long arrow), heterogeneous type I, II (KATO 13373). -3: TLS, *R. luteum*, rays heterogeneous type I (KATO 13453). -4: radial section, *R. smirnovii*, vessel-ray pits, procumbent cells in ray tissue and longitudinal view axial parenchyma. -5: RLS (SEM) *R. ponticum*, scalariform perforation plates (KATO 13424). (Figure 1-3: 1 scale bare = 10 (m (Fig 1-3, magnifications are the same.) Fig 4: 1 scale bare = 10 (m, Fig 5: 10 square = 38 (m).

Wood anatomical characters were found to be significantly correlated with one non-anatomical factor (altitude), but the degree of significance varies between species: one for R. ungernii, six for R. smirnovii, nine for R. caucasicum, five for R. ponticum. In R. luteum, it is found that there is no significant correlation between anatomical characters and altitude.

Generally, intraspecific variation of wood anatomical characters tends to be large for species having a large altitudinal range, but *R. ponticum* shows smaller variation, although it has a larger altitudinal range. The largest variation is observed between some wood anatomical characters and altitude in *R. caucasicum* and *R. smirnovii*.

There is a strong negative correlation between altitude and stem diameter, tangential pore diameter, perforation plates length, multiseriate ray width (in cell and in micron), fibre-tracheid length and wall thickness, vascular tracheid length and lumen width, and a strong positive correlation pore density in *R. caucasicum*. In *R. ponticum*, tangential pore diameter, perforation plate length, vessel element length, fibre-tracheid length, libriform fibre length show a strongly negative correlation with altitude. There is only a positive correlation plate length in *R. smirnovii*. The other characters (multiseriate ray width, libriform fibre and tracheid length) have a negative correlation with altitude.

Against stem diameter (NAF), multiseriate ray width, fibre width (FW, LW, TW) increased strongly, and tangential pore diameter, fibre length and lumen width increased moderately in R. luteum. Pore diameter, PPL length, multiseriate ray width, fibre wall thickness (FWT, LWT, TWT) and libriform fibre length increased strongly in *R. ungernii*. Uniserate ray height and fibre lumen width decreased moderately, multiseriate ray width, and fibre wall thickness (FWT, TWT) increased moderately in R. smirnovii. Some characters of vessel (TD, PPL, VEL) and fibre (FL, FW, FWT, TL, TLW, TWT) increased, and pore density and multiseriate rays in mm decreased with stem diameter in R. caucasicum. In R. ponticum, pore diameter, multiseriate ray width, fibre-tracheid length and width, and libriform fibre length are significantly correlated (positive) with stem diameter.

In *Rhododendron* species, stem age has a positive relation with rays width, fibre wall thickness and pore

diameter, but it has a negative correlation with bar number. In addition, vessel element length, bar number, perforation plate length, pore diameter and fibre length are mutually and strongly positively correlated with each other. Uniseriate ray ratio is strongly correlated with uniseriate and multiseriate rays in mm and in mm², which differ within species.

Uniseriate ray in mm is strongly correlated (negative) with annual ring width, and positively correlated with pore diameter (*R. luteum* and *R. ungernii*). Pore diameter, PP length, vessel element length, fibre length and lumen width (FL, LL, T) is positively, and pore density is negatively correlated with WAR in *R. caucasicum*. Pore diameter, solitary pore ratio, and tracheid length is positively correlated with WAR in *R. ponticum*.

Altitude also influences stem diameter and width of annual rings. There is a strong negative correlation between altitude, stem diameter and annual ring width. At the same time, no correlation is found between altitude and bar number per perforation plates, multiseriate rays height and density, multiseriate and uniseriate rays in mm, fibre width, percentage of solitary pore and uniseriate rays which differ within species.

According to the results of the multiple regression analysis, five anatomical characters are significantly negatively correlated with altitude in *R. ponticum* and *R. caucasicum*. Tangential pore diameter, perforation plate length, vessel element length and fibre length, and multiseriate ray width have a stronger correlation with altitude compared to with stem diameter, stem age, and annual ring width. Pore density has an equal relationship with altitude, stem diameter and stem age. Annual ring width has a direct influence on pore density compared to altitude, stem diameter, and stem age (Table 5).

Discussion

Wood anatomical variation of Nepalese *Rhododendron* was studied by Noshiro et al. (8) and Noshiro et al. (12) in 26 different species, indicating that the wood structure of *Rhododendron* species is rather homogeneous, and intraspecific (species level) variation is less pronounced than the interspecific (genus level) variation (8, 12).

Intraspecific studies on wood anatomy have so far been carried out on *R. antropogen* D. Don, *R.*

Ecological Wood Anatomy of Turkish Rhododendron L. (Ericaceae). Intraspecific Variation

| ALT (m) | SD (cm) | SA (year) | WAR (mm) | TD (µm) | BAR | PPL (µm) | MRH1 (µm) | MRW2 (cell) | MRW (μm) | PD | MRD | MRmm |
|------------|------------|--------------|-------------|------------|-----|-------------|--------------|----------------|-------------|-----|------|------|
| 900 | 4.0 | 23 | 0.8 | 29 | 17 | 70 | 559 | 3.6 | 39 | 526 | 5.5 | 3.2 |
| 950 | 6.6 | 22 | 1.9 | 32 | 19 | 79 | 458 | 3.4 | 36 | 457 | 7.9 | 3.2 |
| 1000 | 4.0 | 17 | 1.8 | 28 | 19 | 76 | 505 | 3.5 | 41 | 385 | 10.6 | 4.6 |
| 1150 | 4.9 | 23 | 1.3 | 27 | 18 | 73 | 610 | 3.7 | 37 | 421 | 7.2 | 3.7 |
| 1200 | 5.2 | 23 | 1.0 | 29 | 19 | 71 | 517 | 4.5 | 52 | 402 | 6.0 | 2.7 |
| 1300 | 3.6 | 25 | 1.0 | 31 | 18 | 72 | 591 | 3.5 | 46 | 379 | 9.6 | 5.0 |
| 1350 | 4.0 | 18 | 1.2 | 32 | 18 | 64 | 447 | 3.9 | 41 | 403 | 7.6 | 2.7 |
| 1400 | 10.9 | 72 | 1.3 | 34 | 20 | 81 | 592 | 5.8 | 59 | 354 | 5.8 | 3.1 |
| 1450 | 4.0 | 16 | 1.2 | 28 | 19 | 73 | 518 | 3.1 | 37 | 359 | 9.3 | 4.0 |
| 1490 | 5.0 | 35 | 0.6 | 25 | 15 | 59 | 449 | 4.8 | 55 | 438 | 5.2 | 2.2 |
| 1550 | 3.1 | 28 | 0.7 | 26 | 17 | 66 | 652 | 3.8 | 47 | 378 | 4.2 | 2.3 |
| 1600 | 5.1 | 44 | 0.4 | 28 | 18 | 71 | 639 | 3.3 | 37 | 462 | 5.9 | 3.4 |
| 1650 | 2.4 | 25 | 0.6 | 26 | 18 | 68 | 602 | 3.3 | 41 | 400 | 13.9 | 5.9 |
| 1700 | 2.0 | 10 | 1.2 | 23 | 15 | 61 | 458 | 2.6 | 28 | 414 | 20.7 | 8.7 |
| 1770 | 6.4 | 61 | 0.7 | 25 | 20 | 68 | 538 | 3.8 | 45 | 466 | 5.9 | 2.9 |
| 1790 | 2.8 | 20 | 0.9 | 23 | 18 | 66 | 645 | 4.2 | 47 | 390 | 9.5 | 5.2 |
| 1800 | 5.0 | 50 | 0.4 | 24 | 19 | 73 | 567 | 4.4 | 54 | 436 | 5.8 | 3.1 |
| 1900 | 2.7 | 11 | 0.7 | 23 | 18 | 64 | 584 | 3.4 | 41 | 378 | 6.1 | 2.8 |
| 2020 | 2.0 | 18 | 0.4 | 24 | 17 | 62 | 495 | 4.6 | 48 | 471 | 11.0 | 4.7 |

Table 1. Non-anatomical data and wood anatomical characters of Rhododendron ungernii.

Table 1. Continued

| Urmm | VEL (µm) | FL (µm) | FW (µm) | FWT (µm) | LL (µm) | LW (µm) | LWT (µm) | SP % | UR % | TL (μm) | TW (μm) | TWT (µm) |
|------|-------------|------------|------------|-------------|------------|------------|-------------|---------|---------|------------|------------|-------------|
| 21 | 595 | 674 | 18 | 3.4 | 796 | 19 | 3.5 | 72 | 72 | 505 | 23 | 2.6 |
| 17 | 462 | 629 | 20 | 3.6 | 792 | 21 | 4.0 | 62 | 72 | 388 | 27 | 3.1 |
| 14 | 631 | 698 | 19 | 3.2 | 869 | 20 | 3.5 | 77 | 56 | 550 | 27 | 2.9 |
| 20 | 515 | 610 | 19 | 3.12 | 778 | 20 | 3.5 | 76 | 70 | 463 | 27 | 3.1 |
| 17 | 474 | 666 | 18 | 3.49 | 766 | 20 | 3.7 | 76 | 71 | 441 | 25 | 3.6 |
| 15 | 518 | 635 | 19 | 3.40 | 757 | 21 | 3.8 | 88 | 53 | 467 | 25 | 2.8 |
| 18 | 486 | 643 | 20 | 3.82 | 770 | 22 | 3.7 | 72 | 76 | 473 | 27 | 3.4 |
| 18 | 549 | 732 | 21 | 4.24 | 907 | 21 | 4.2 | 61 | 64 | 524 | 28 | 3.6 |
| 16 | 549 | 651 | 19 | 3.42 | 826 | 21 | 3.6 | 62 | 66 | 542 | 26 | 2.8 |
| 17 | 486 | 612 | 19 | 3.51 | 755 | 20 | 3.5 | 63 | 69 | 441 | 26 | 2.9 |
| 21 | 499 | 583 | 20 | 2.79 | 781 | 22 | 3.2 | 72 | 77 | 420 | 26 | 2.8 |
| 21 | 567 | 682 | 18 | 2.79 | 799 | 19 | 2.8 | 71 | 73 | 539 | 23 | 2.6 |
| - | 537 | 702 | 17 | 3.21 | 815 | 17 | 3.3 | 64 | - | 516 | 23 | 3.0 |
| 14 | 476 | 588 | 17 | 3.17 | 720 | 19 | 3.6 | 75 | 48 | 452 | 22 | 2.8 |
| 18 | 510 | 665 | 17 | 3.73 | 791 | 19 | 3.8 | 57 | 71 | 479 | 24 | 3.5 |
| 14 | 529 | 641 | 18 | 3.59 | 782 | 22 | 3.2 | 74 | 51 | 512 | 25 | 3.1 |
| 18 | 494 | 635 | 20 | 3.77 | 764 | 20 | 3.5 | 70 | 67 | 461 | 25 | 3.2 |
| 19 | 464 | 603 | 19 | 3.17 | 774 | 19 | 3.0 | 64 | 75 | 464 | 27 | 2.8 |
| 15 | 553 | 669 | 17 | 2.79 | 792 | 20 | 3.0 | 63 | 55 | 499 | 22 | 2.9 |

| ALT (m) | SD (cm) | SA (year) | WAR (mm) | TD (µm) | BAR | PPL (µm) | MRH1 (µm) | MRW2 (cell) | MRW (µm) | PD | MRD | MRmm |
|------------|------------|--------------|-------------|------------|-----|-------------|--------------|----------------|-------------|-----|------|------|
| 1350 | 4.0 | 25 | 0.8 | 29 | 15 | 62 | 357 | 4.1 | 39 | 494 | 7.4 | 2.9 |
| 1600 | 4.0 | 38 | 0.5 | 26 | 19 | 74 | 582 | 3.8 | 45 | 485 | 5.2 | 2.8 |
| 1620 | 5.0 | 33 | 0.9 | 29 | 17 | 64 | 477 | 4.1 | 43 | 510 | 5.1 | 2.2 |
| 1660 | 2.5 | 22 | 0.5 | 28 | 19 | 68 | 514 | 3.5 | 42 | 522 | 7.1 | 3.1 |
| 1680 | 5.7 | 38 | 0.9 | 28 | 21 | 69 | 501 | 4.0 | 53 | 387 | 8.1 | 3.2 |
| 1700 | 4.6 | 40 | 0.6 | 25 | 18 | 61 | 480 | 4.3 | 42 | 338 | 3.5 | 1.8 |
| 1730 | 2.6 | 32 | 0.6 | 25 | 15 | 57 | 439 | 3.3 | 30 | 455 | 8.1 | 3.5 |
| 1750 | 3.9 | 32 | 0.6 | 29 | 18 | 64 | 494 | 3.6 | 37 | 437 | 7.2 | 2.8 |
| 1770 | 2.7 | 27 | 0.5 | 25 | 17 | 63 | 530 | 3.4 | 39 | 501 | 6.2 | 3.0 |
| 1850 | 2.2 | 11 | 0.8 | 28 | 15 | 56 | 553 | 3.9 | 54 | 283 | 8.1 | 4.1 |
| 1900 | 6.0 | 50 | 0.3 | 24 | 16 | 68 | 398 | 3.7 | 37 | 432 | 10.0 | 3.4 |
| 1970 | 1.2 | 12 | 0.4 | 24 | 15 | 56 | 497 | 3.2 | 40 | 492 | 7.5 | 3.5 |
| 2020 | 7.0 | 75 | 0.3 | 24 | 15 | 57 | 446 | 3.8 | 32 | 507 | 7.9 | 3.3 |
| 2060 | 3.8 | 35 | 0.5 | 23 | 15 | 57 | 488 | 2.9 | 26 | 577 | 9.2 | 4.4 |
| 2230 | 2.5 | 22 | 0.6 | 20 | 15 | 54 | 465 | 2.8 | 26 | 531 | 6.4 | 2.9 |

Table 2. Non-anatomical data and wood anatomical characters of *Rhododendron* smirnovii.

Table 2. Continued

| Urmm | VEL (µm) | FL (µm) | FW (µm) | FWT (µm) | LL (µm) | LW (µm) | LWT (µm) | SP % | UR % | TL (μm) | TW (μm) | TWT (µm) |
|------|-------------|------------|------------|-------------|------------|------------|-------------|---------|---------|------------|------------|-------------|
| 18 | 461 | 592 | 18 | 3.3 | 719 | 20 | 3.5 | 67 | 69 | 415 | 25 | 2.9 |
| 19 | 534 | 649 | 18 | 3.8 | 821 | 19 | 3.4 | 70 | 73 | 471 | 25 | 3.0 |
| 19 | 500 | 652 | 16 | 3.1 | 776 | 19 | 3.1 | 58 | 74 | 493 | 24 | 2.9 |
| 18 | 482 | 667 | 18 | 4.8 | 776 | 21 | 4.3 | 80 | 67 | 452 | 24 | 4.3 |
| 19 | 561 | 610 | 19 | 3.6 | 795 | 20 | 3.7 | 65 | 67 | 445 | 21 | 2.5 |
| 25 | 427 | 512 | 18 | 3.2 | 632 | 19 | 3.0 | 62 | 67 | 400 | 22 | 2.5 |
| 17 | 509 | 659 | 18 | 3.5 | 753 | 20 | 3.7 | 50 | 75 | 467 | 22 | 3.2 |
| 17 | 529 | 653 | 17 | 2.8 | 770 | 18 | 3.2 | 63 | 72 | 446 | 23 | 2.6 |
| 14 | 461 | 569 | 19 | 3.2 | 722 | 21 | 3.2 | 65 | 57 | 456 | 26 | 2.9 |
| 20 | 452 | 644 | 17 | 2.4 | 770 | 19 | 3.9 | 66 | 70 | 438 | 23 | 3.3 |
| 18 | 517 | 588 | 16 | 2.6 | 727 | 18 | 2.8 | 61 | 66 | 461 | 24 | 3.1 |
| 17 | 492 | 612 | 16 | 3.5 | 708 | 19 | 3.5 | 66 | 68 | 500 | 22 | 3.3 |
| 19 | 418 | 53 | 15 | 3.0 | 643 | 17 | 3.5 | 67 | 66 | 426 | 21 | 2.7 |
| 24 | 435 | 524 | 17 | 3.5 | 637 | 17 | 3.3 | 69 | 79 | 410 | 22 | 3.0 |

Ecological Wood Anatomy of Turkish Rhododendron L. (Ericaceae). Intraspecific Variation

| ALT (m) | SD (cm) | SA (year) | WAR (mm) | TD (μm) | BAR | PPL (µm) | MRH1 (µm) | MRW2 (cell) | MRW (µm) | PD | MRD | MRmm |
|------------|------------|--------------|-------------|------------|-----|-------------|--------------|----------------|-------------|------|------|------|
| 1900 | 2.0 | 31 | 0.5 | 25 | 15 | 57 | 542 | 3.3 | 36 | 576 | 5.7 | 2.8 |
| 1950 | 1.8 | 24 | 0.4 | 23 | 13 | 43 | 513 | 3.0 | 29 | 635 | 6.5 | 3.1 |
| 2000 | 1.4 | 16 | 0.4 | 22 | 13 | 50 | 639 | 3.3 | 34 | 760 | 3.9 | 2.3 |
| 2050 | 1.0 | 11 | 0.4 | 21 | 13 | 48 | 502 | 4.1 | 38 | 778 | 6.7 | 3.6 |
| 2100 | 1.0 | 14 | 0.3 | 20 | 12 | 49 | 545 | 2.8 | 25 | 691 | 5.4 | 3.0 |
| 2150 | 1.7 | 13 | 0.4 | 21 | 11 | 47 | 522 | 3.1 | 30 | 643 | 4.2 | 2.0 |
| 2200 | 1.8 | 27 | 0.3 | 22 | 22 | 45 | 554 | 4.2 | 40 | 636 | 4.2 | 2.4 |
| 2230 | 1.0 | 13 | 0.3 | 21 | 13 | 51 | 571 | 2.7 | 24 | 716 | 10.1 | 4.2 |
| 2310 | 1.8 | 20 | 0.4 | 21 | 11 | 39 | 466 | 2.2 | 21 | 818 | 10.3 | 3.8 |
| 2320 | 0.7 | 8 | 0.2 | 20 | 13 | 48 | 562 | 2.8 | 26 | 818 | 7.4 | 3.9 |
| 2350 | 0.9 | 11 | 0.3 | 19 | 13 | 49 | 533 | 2.9 | 29 | 898 | 6.5 | 3.4 |
| 2380 | 1.6 | 31 | 0.3 | 22 | 13 | 46 | 640 | 3.0 | 27 | 807 | 10.1 | 5.4 |
| 2400 | 0.9 | 16 | 0.2 | 20 | 11 | 41 | 527 | 3.0 | 31 | 951 | 6.2 | 3.7 |
| 2450 | 0.8 | 16 | 0.2 | 17 | 13 | 43 | 555 | 3.0 | 26 | 962 | 6.9 | 4.0 |
| 2500 | 0.8 | 14 | 0.2 | 19 | 11 | 39 | 555 | 3.3 | 33 | 744 | 4.9 | 2.7 |
| 2550 | 1.1 | 11 | 0.3 | 19 | 10 | 43 | 574 | 2.2 | 20 | 757 | 20.2 | 10.2 |
| 2600 | 1.0 | 18 | 0.3 | 18 | 14 | 49 | 538 | 2.7 | 23 | 757 | 11.1 | 6.1 |
| 2650 | 1.1 | 23 | 0.2 | 19 | 12 | 46 | 553 | 3.5 | 33 | 740 | 5.1 | 3.0 |
| 2700 | 0.8 | 5 | 0.4 | 16 | 11 | 40 | 551 | 2.4 | 23 | 731 | 10.9 | 6.3 |
| 2750 | 0.5 | 12 | 0.2 | 17 | 10 | 34 | 559 | 2.5 | 23 | 817 | 13.0 | 7.2 |
| 2850 | 0.7 | 15 | 0.2 | 17 | 11 | 42 | 396 | 2.8 | 24 | 840 | 11.0 | 7.0 |
| 2950 | 0.6 | 16 | 0.2 | 17 | 11 | 42 | 425 | 2.8 | 25 | 896 | 12.2 | 5.9 |
| 3000 | 0.5 | 16 | 0.1 | 16 | 10 | 36 | 528 | 2.8 | 26 | 899 | 11.3 | 6.2 |
| 3050 | 0.6 | 14 | 0.2 | 16 | 10 | 35 | 577 | 2.9 | 25 | 828 | 5.4 | 3.5 |
| 3100 | 0.7 | 10 | 0.2 | 15 | 11 | 38 | 745 | 2.5 | 23 | 1018 | 6.2 | 4.3 |

Table 3. Non-anatomical data and wood anatomical characters of *Rhododendron* caucasicum.

Table 3. Continued

| URmm | VEL | FL | FW | FWT | SP | UR | TL | TW | TWT | |
|------|------|------|------|------|----|----|------|------|------|--|
| | (µm) | (µm) | (µm) | (µm) | % | % | (µm) | (µm) | (µm) | |
| 20 | 424 | 535 | 15 | 3.1 | 67 | 72 | - | - | - | |
| 21 | 359 | 479 | 14 | 3.0 | 66 | 74 | 347 | 21 | 2.5 | |
| 22 | 387 | 505 | 15 | 3.2 | 47 | 78 | 385 | 23 | 2.8 | |
| 22 | 335 | 445 | 15 | 2.8 | 71 | 70 | 350 | 21 | 2.2 | |
| 25 | 342 | 428 | 15 | 3.2 | 77 | 81 | 333 | 21 | 2.6 | |
| 24 | 348 | 427 | 15 | 3.2 | 60 | 85 | 351 | 21 | 2.5 | |
| 25 | 349 | 412 | 16 | 3.0 | 72 | 79 | 340 | 24 | 2.8 | |
| 21 | 328 | 407 | 15 | 2.8 | 73 | 74 | 325 | 21 | 2.6 | |
| 21 | 345 | 417 | 15 | 2.8 | 68 | 75 | 299 | 23 | 2.7 | |
| 23 | 304 | 351 | 13 | 2.2 | 64 | 76 | 233 | 21 | 2.7 | |
| 27 | 293 | 397 | 13 | 2.3 | 62 | 80 | 233 | 20 | 2.1 | |
| 22 | 361 | 413 | 15 | 3.5 | 68 | 70 | 331 | 20 | 2.8 | |
| 23 | 310 | 387 | 14 | 2.8 | 65 | 74 | 310 | 18 | 2.2 | |
| 26 | 322 | 427 | 13 | 2.2 | 56 | 75 | 288 | 20 | 2.8 | |
| 26 | 334 | 441 | 13 | 2.5 | 57 | 80 | - | - | - | |
| 17 | 385 | 442 | 14 | 2.8 | 63 | 50 | 383 | 22 | 17.5 | |
| 21 | 335 | 412 | 16 | 2.7 | 62 | 61 | 311 | 22 | 2.7 | |
| 26 | 308 | 421 | 16 | 2.8 | 60 | 77 | 320 | 22 | 2.7 | |
| 22 | 293 | 413 | 16 | 2.7 | 64 | 65 | - | - | - | |
| 21 | 261 | 336 | 14 | 2.6 | 60 | 63 | 254 | 19 | 2.2 | |
| 21 | 245 | 350 | 13 | 2.5 | 55 | - | - | - | - | |
| 22 | 240 | 341 | 13 | 2.0 | 60 | - | - | - | - | |
| 24 | 242 | 332 | 14 | 2.0 | 53 | 63 | - | - | - | |
| 26 | 240 | 326 | 14 | 2.3 | 73 | 78 | 280 | 18 | 2.2 | |
| 25 | 288 | 363 | 12 | 2.2 | 58 | 72 | 308 | 18 | 2.3 | |

| ALT | SD | SA | WAR | TD | BAR | PPL | MRH1 | MRW2 | MRW | PD | MRD | MRmm |
|--|--|--|--|--|--|---|--|--|---|---|--|--|
| (m) | (cm) | (year) | (mm) | (µm) | | (µm) | (µm) | (cell) | (µm) | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| 5 | 4.4 | 10 | 2.1 | 30 | 18 | 71 | 657 | 3.3 | 39 | 462 | 5.8 | 3.7 |
| 50 | 3.9 | 13 | 1.7 | 29 | 16 | 66 | 480 | 3.5 | 41 | 510 | 14.6 | 6.4 |
| 100 | 4.0 | 34 | 0.9 | 27 | 21 | 82 | 767 | 5.2 | 65 | 559 | 2.8 | 2.3 |
| 140 | 7.3 | 30 | 1.8 | 30 | 17 | 65 | 541 | 4.5 | 54 | 414 | 4.6 | 2.4 |
| 250 | 3.5 | 11 | 1.7 | 31 | 18 | 67 | 687 | 3.5 | 46 | 476 | 3.8 | 2.2 |
| 380 | 6.8 | 40 | 1.1 | 28 | 18 | 72 | 797 | 5.4 | 54 | 640 | 4.5 | 3.5 |
| 450 | 3.9 | 10 | 1.8 | 33 | 15 | 59 | 526 | 3.7 | 44 | 343 | 10.3 | 3.8 |
| 490 | 3.7 | 14 | 1.2 | 31 | 18 | 68 | 622 | 4.3 | 52 | 521 | 7.7 | 3.9 |
| 550 | 3.7 | 13 | 1.5 | 30 | 13 | 57 | 413 | 3.1 | 40 | 365 | 9.7 | 3.8 |
| 600 | 2.3 | 21 | 0.7 | 28 | 15 | 63 | 568 | 3.2 | 40 | 478 | 4.1 | 1.8 |
| 650 | 2.5 | 13 | 0.9 | 28 | 16 | 63 | 572 | 3.8 | 42 | 501 | 5.2 | 2.9 |
| 750 | 2.4 | 26 | 0.6 | 27 | 16 | 62 | 492 | 4.1 | 43 | 539 | 4.2 | 2.1 |
| 800 | 3.7 | 32 | 0.8 | 28 | 17 | 69 | 538 | 3.4 | 38 | 495 | 9.9 | 4.4 |
| 850 | 2.3 | 17 | 0.9 | 23 | 18 | 66 | 557 | 3.4 | 38 | 501 | 4.7 | 2.5 |
| 900 | 1.9 | 15 | 0.6 | 23 | 14 | 60 | 742 | 3.3 | 37 | 565 | 4.4 | 2.9 |
| 980 | 2.0 | 11 | 1.4 | 24 | 17 | 67 | 503 | 3.6 | 43 | 408 | 6.0 | 3.1 |
| 1000 | 3.3 | 21 | 1.2 | 27 | 16 | 58 | 553 | 4.6 | 56 | 339 | 5.1 | 2.7 |
| 1060 | 2.3 | 12 | 1.1 | 26 | 16 | 61 | 509 | 3.8 | 43 | 461 | 4.2 | 1.8 |
| 1080 | 1.7 | 26 | 0.5 | 22 | 17 | 66 | 567 | 3.1 | 36 | 466 | 3.4 | 2.0 |
| 1100 | 11.9 | 149 | 0.5 | 30 | 18 | 72 | 545 | 3.7 | 45 | 348 | 4.9 | 2.6 |
| 1150 | 4.1 | 37 | 0.4 | 25 | 15 | 64 | 554 | 3.6 | 60 | 896 | 11.9 | 5.1 |
| 1200 | 1.8 | 14 | 0.7 | 28 | 16 | 68 | 515 | 3.3 | 41 | 429 | 55 | 3.1 |
| 1250 | 2.2 | 19 | 0.5 | 23 | 16 | 66 | 607 | 3.2 | 33 | 485 | 4.3 | 2.5 |
| 1300 | 1.0 | 5 | 0.5 | 22 | 15 | 60 | 728 | 3.0 | 34 | 505 | 65 | 3.8 |
| 1370 | 0.8 | 4 | 0.5 | 22 | 15 | 63 | 720 | 3.0 | 35 | 551 | 27 | 1.4 |
| 1450 | 15 | 10 | 0.7 | 21 | 17 | 67 | 779 | 35 | 39 | 583 | 53 | 3.4 |
| 1500 | 2.8 | 20 | 0.7 | 26 | 15 | 53 | /03 | 3.2 | 12 | 468 | 7.8 | 3.1 |
| 1650 | 1.5 | 10 | 0.4 | 26 | 17 | 66 | 591 | 3.5 | 47 | 531 | 6.1 | 33 |
| 1700 | 1.5 | 11 | 0.0 | 20 | 19 | 67 | 709 | 3.0 | 47 50 | 406 | 6.0 | 13 |
| 1730 | 1.5 | 25 | 0.0 | 20 | 17 | 66 | 557 | 2.4 | 35 | 400 | 12.2 | 4.5 |
| 1950 | 1.7 | 10 | 0.5 | 21 | 15 | 62 | 557 | 2.0 | 30 | 400 | 12.2 | J.0 |
| 1070 | 1.5 | 10 | 0.5 | 21 | 13 | 62 | 552 | 2.9 | 29 | 701 | 0.0 | 4.4 |
| 2100 | 1.0 | 10 | 0.5 | 22 | 14 | 37 | 559 | 3.3 | 20 | 701 | 0.2 | 4.1 |
| 2100 | 1.5 | 10 | 0.4 | 22 | 13 | 40 | 004 | 5.5 | 50 | 515 | 9.7 | 3.0 |
| 2230 | 5.1 | 55 | 0.5 | 20 | 14 | 54 | 554 | 5.5 | 51 | 551 | 0.3 | 3.5 |
| Table 4 | Continu | I | | | | | | | | | | |
| | | 1/ 1/ 1 | | | | | | | | | | |
| Tuble 4. | Continu | iea | | | | | | | | | | |
| Urmm | VEL | FL | FW | FWT | Ш. | IW | IWT | SP | UR | TL | TW | TWT |
| Urmm | VEL | FL (um) | FW (um) | FWT (µm) | LL (µm) | LW (um) | LWT (um) | SP % | UR % | TL (um) | TW (um) | TWT (um) |
| Urmm | VEL (µm) | FL (µm) | FW (µm) | FWT (µm) | LL (µm) | LW (µm) | LWT (µm) | SP % | UR % | TL (μm) | TW (μm) | TWT (µm) |
| Urmm 19 | VEL (µm) 632 | FL (μm) 750 | FW (μm) 18 | FWT (μm) 3.9 | LL (μm) 862 | LW (μm) 20 | LWT (μm) 4.3 | SP % | UR % | TL (μm) 563 | TW (μm) 26 | TWT (μm) 3.7 |
| Urmm 19 15 | VEL (μm) 632 644 | FL (μm) 750 749 | FW (μm) 18 18 | FWT (μm) 3.9 3.8 | LL (μm) 862 855 | LW (μm) 20 19 | LWT (μm) 4.3 857 | SP % 66 73 | UR % 67 47 | TL (μm) 563 426 | TW (μm) 26 24 | TWT (μm) 3.7 3.2 |
| Urmm 19 15 20 | VEL (μm) 632 644 647 | FL (μm) 750 749 722 | FW (μm) 18 18 19 | FWT (μm) 3.9 3.8 3.8 | LL (μm) 862 855 928 | LW (μm) 20 19 19 | LWT (μm) 4.3 857 4.2 | SP % 66 73 85 | UR % 67 47 71 | TL (μm) 563 426 519 | TW (μm) 26 24 27 | TWT (μm) 3.7 3.2 3.2 |
| 19 15 20 19 | VEL (μm) 632 644 647 603 | FL (μm) 750 749 722 761 | FW (μm) 18 18 19 18 | FWT (μm) 3.9 3.8 3.8 4.2 | LL (μm) 862 855 928 963 | LW (μm) 20 19 19 | LWT (μm) 4.3 857 4.2 4.2 | SP % 66 73 85 83 | UR % 67 47 71 73 | TL (μm) 563 426 519 542 | TW (μm) 26 24 27 23 | TWT (μm) 3.7 3.2 3.2 3.3 |
| Urmm 19 15 20 19 23 | VEL (μm) 632 644 647 603 537 | FL (μm) 750 749 722 761 747 | FW (μm) 18 18 19 18 20 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 | LL (μm) 862 855 928 963 910 | LW (μm) 20 19 19 19 21 | LWT (μm) 4.3 857 4.2 4.2 3.7 | SP % 66 73 85 83 74 | UR % 67 47 71 73 78 | TL (μm) 563 426 519 542 501 | TW (μm) 26 24 27 23 26 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 |
| Urmm 19 15 20 19 23 21 | VEL (μm) 632 644 647 603 537 638 | FL (μm) 750 749 722 761 747 761 | FW (μm) 18 18 19 18 20 19 | FWT (μm) 3.9 3.8 3.8 3.8 4.2 3.4 3.6 | LL (μm) 862 855 928 963 910 911 | LW (µm) 20 19 19 19 21 20 | LWT (µm) 4.3 857 4.2 4.2 3.7 3.9 | SP % 66 73 85 83 74 62 | UR % 67 47 71 73 78 63 | TL (μm) 563 426 519 542 501 637 | TW (μm) 26 24 27 23 26 24 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 |
| Urmm 19 15 20 19 23 21 17 | VEL (μm) 632 644 647 603 537 638 473 | FL (μm) 750 749 722 761 747 761 622 | FW (μm) 18 18 19 18 20 19 21 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 | LL (μm) 862 855 928 963 910 911 851 | LW (μm) 20 19 19 19 21 20 20 | LWT (μm) 4.3 857 4.2 4.2 4.2 3.7 3.9 4.0 | SP % 66 73 85 83 74 62 79 | UR % 67 47 71 73 78 63 64 | TL (μm) 563 426 519 542 501 637 424 | TW (μm) 26 24 27 23 26 24 28 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 |
| Urmm 19 15 20 19 23 21 17 17 | VEL (μm) 632 644 647 603 537 638 473 517 | FL (μm) 750 749 722 761 747 761 622 676 | FW (μm) 18 18 19 18 20 19 21 19 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 | LL (μm) 862 855 928 963 910 911 851 858 | LW (μm) 20 19 19 21 20 20 20 | LWT (μm) 4.3 857 4.2 4.2 4.2 3.7 3.9 4.0 2.8 | SP % 66 73 85 83 74 62 79 74 | UR % 67 71 73 78 63 63 64 59 | TL (μm) 563 426 519 542 501 637 424 485 | TW (μm) 26 24 27 23 26 24 28 24 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 2.8 |
| Urmm 19 15 20 19 23 21 17 17 19 | VEL (μm) 632 644 647 603 537 638 473 517 520 | FL (μm) 750 749 722 761 747 761 622 676 614 | FW (μm) 18 18 19 18 20 19 21 19 21 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 | LL (μm) 862 855 928 963 910 911 851 858 832 | LW (μm) 20 19 19 19 21 20 20 20 20 | LWT (μm) 4.3 857 4.2 4.2 4.2 3.7 3.9 4.0 2.8 3.5 | SP % 66 73 85 83 74 62 79 74 75 | UR % 67 47 71 73 78 63 64 59 67 | TL (μm) 563 426 519 542 501 637 424 485 461 | TW (μm) 26 24 27 23 26 24 28 24 28 24 26 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 2.8 3.1 |
| Urmm 19 15 20 19 23 21 17 17 19 22 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 | FL (μm) 750 749 722 761 747 761 622 676 614 648 | FW (μm) 18 18 19 18 20 19 21 19 21 19 17 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.4 | LL (μm) 862 855 928 963 910 911 851 851 858 832 842 | LW (μm) 20 19 19 21 20 20 20 20 20 20 | LWT (μm) 4.3 857 4.2 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 | SP % 66 73 85 83 74 62 79 74 75 81 | UR % 67 47 71 73 78 63 64 59 67 88 | TL (μm) 563 426 519 542 501 637 424 485 461 541 | TW (μm) 26 24 27 23 26 24 28 24 28 24 26 21 | TWT (μm) 3.7 3.2 3.3 3.1 2.8 3.5 2.8 3.5 2.8 3.1 2.9 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 22 19 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 | FW (μm) 18 18 19 18 20 19 21 19 21 19 19 17 18 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.1 3.4 2.8 | LL (μm) 862 855 928 963 910 911 851 851 858 832 842 885 | LW (μm) 20 19 19 21 20 20 20 20 20 20 21 7 21 | LWT (μm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 | SP % 66 73 85 83 74 62 79 74 75 81 83 | UR % 47 71 73 78 63 64 59 67 88 73 | TL (μm) 563 426 519 542 501 637 424 485 461 541 543 | TW (μm) 26 24 27 23 26 24 28 24 28 24 26 21 24 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 2.8 3.5 2.8 3.1 2.9 2.8 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 17 19 17 19 17 19 17 19 17 19 19 19 19 19 19 19 19 19 19 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 636 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 722 | FW (μm) 18 18 19 18 20 19 21 19 21 19 19 17 18 19 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.1 3.4 2.8 3.6 | LL (μm) 862 855 928 963 910 911 851 851 858 832 842 842 842 842 843 919 | LW (μm) 20 19 19 21 20 20 20 20 20 17 21 19 | LWT (μm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 | SP % 66 73 85 83 74 62 79 74 75 81 83 65 | UR % 67 47 71 73 78 63 63 63 63 63 67 88 73 77 | TL (μm) 563 426 519 542 501 637 424 485 461 541 543 576 | TW (μm) 26 24 27 23 26 24 28 24 26 21 24 26 21 24 23 | TWT (µm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.1 2.9 3.0 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 22 19 19 15 20 19 19 15 20 19 19 23 21 17 19 15 20 21 17 19 15 20 21 19 15 20 21 19 15 20 21 19 15 20 21 19 23 21 17 19 15 20 19 15 20 19 15 20 19 15 20 19 15 20 19 15 20 19 15 20 19 15 20 19 15 16 17 19 19 23 21 17 19 19 23 21 17 19 19 23 21 17 19 19 22 19 19 22 19 19 19 22 19 19 22 19 19 19 22 19 19 19 19 22 19 19 19 19 19 19 19 19 19 19 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 636 623 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 678 722 735 | FW (μm) 18 18 19 18 20 19 21 19 21 19 19 17 18 19 19 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 | LL (μm) 862 855 928 963 910 911 851 858 832 842 885 842 885 919 918 | LW (μm) 20 19 19 19 21 20 20 20 20 20 20 17 21 19 18 | LWT (µm) 4.3 857 4.2 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 | SP % 66 73 85 83 74 62 79 74 75 81 83 65 67 | UR % 67 47 71 73 63 63 64 59 67 88 73 77 59 | TL (μm) 563 426 519 542 501 637 424 485 461 541 541 541 543 576 557 | TW (μm) 26 24 27 23 26 24 28 24 28 24 26 21 24 23 25 | TWT (μm) 3.7 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.1 2.9 2.8 3.0 3.3 |
| Urmm 19 15 20 19 23 21 17 17 19 22 21 19 19 22 21 17 19 22 21 19 19 22 21 19 15 20 22 21 19 15 22 22 21 19 19 22 22 21 19 19 22 22 21 19 22 22 21 19 22 22 21 19 22 22 21 19 22 22 21 19 22 22 21 19 22 22 21 19 22 22 21 19 22 22 21 19 22 22 21 19 22 22 21 19 22 22 22 19 22 22 22 19 22 22 19 22 22 19 22 22 19 19 22 22 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 636 623 573 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 722 735 647 | FW (μm) 18 19 18 20 19 21 19 21 19 17 18 19 17 18 19 17 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.1 3.4 2.8 3.6 3.5 3.5 | LL (μm) 862 855 928 963 910 911 851 851 858 832 842 885 919 918 837 | LW (μm) 20 19 19 21 20 20 20 20 20 20 20 21 17 21 19 18 17 | LWT (μm) 4.3 857 4.2 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 4.3 3.5 | SP % 66 73 85 83 74 62 79 74 62 79 74 81 83 65 67 69 | UR % 67 47 71 73 78 63 64 59 64 59 67 88 73 77 59 79 | TL (μm) 563 426 519 542 501 637 424 485 461 541 543 576 557 508 | TW (μm) 26 24 27 23 26 24 28 24 28 24 26 21 24 23 25 24 | TWT (μm) 3.7 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 17 19 12 19 17 19 12 19 17 19 12 19 23 21 19 19 23 21 19 19 23 21 19 19 23 21 19 19 23 21 19 19 23 21 19 19 23 21 19 19 19 19 19 19 19 19 19 1 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 636 623 573 578 5 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 722 735 647 680 | FW (μm) 18 18 19 18 20 19 21 19 21 19 19 19 17 18 19 19 17 7 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.1 3.4 2.8 3.6 3.5 3.4 | LL (μm) 862 855 928 963 910 911 851 858 832 842 885 919 918 837 868 | LW (μm) 20 19 19 21 20 20 20 20 20 20 20 20 17 21 19 18 17 18 | LWT (μm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 4.3 3.5 3.6 | SP % 66 73 85 83 74 62 79 74 75 81 83 65 65 67 69 58 | UR % 67 47 71 73 63 64 59 67 88 73 77 59 73 77 59 73 | TL (μm) 563 426 519 542 501 637 424 485 461 543 576 557 508 527 | TW (μm) 26 24 27 23 26 24 28 24 28 24 26 21 24 23 25 24 21 | TWT (μm) 3.7 3.2 3.3 3.1 2.8 3.5 2.8 3.5 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 22 19 19 16 22 19 18 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 636 623 573 585 546 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 722 735 647 680 688 | FW (μm) 18 18 19 18 20 19 21 19 21 19 19 17 18 19 17 17 18 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 3.5 3.5 3.5 3.5 3.7 | LL (μm) 862 855 928 963 910 911 851 858 832 842 842 842 842 845 918 837 868 837 | LW (μm) 20 19 19 21 20 20 20 20 20 17 21 19 18 17 18 17 | LWT (µm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.9 | SP % 66 73 85 83 74 62 79 74 62 79 74 75 81 83 65 67 69 85 88 82 | UR % 47 71 73 63 64 59 67 88 73 77 59 79 79 73 69 | TL (μm) 563 426 519 542 501 637 424 485 461 541 541 543 576 557 508 527 509 | TW (μm) 26 24 27 23 26 24 28 24 26 21 24 26 21 24 23 25 24 21 24 | TWT (μm) 3.7 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 19 22 19 19 12 21 17 19 22 19 19 15 20 19 19 23 21 17 19 15 20 21 17 19 23 21 17 19 23 21 17 19 23 21 17 19 22 19 23 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 19 19 22 19 19 22 19 19 22 19 19 22 19 19 22 19 19 22 19 19 22 19 19 22 19 19 22 19 19 22 19 19 19 22 19 19 19 22 19 19 19 19 22 19 19 19 22 19 19 19 19 19 19 19 19 19 19 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 636 623 573 585 546 523 534 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 722 735 647 680 648 648 722 | FW (μm) 18 18 19 18 20 19 21 19 21 19 17 17 18 19 17 17 17 18 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 3.5 3.5 3.5 3.4 3.7 4.2 | LL (μm) 862 855 928 963 910 911 851 858 853 842 885 919 918 837 868 837 868 862 862 | LW (μm) 20 19 19 21 20 20 20 20 20 20 20 17 21 19 18 17 18 17 18 | LWT (µm) 4.3 857 4.2 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 4.3 3.5 3.6 3.9 4.7 | SP % 66 73 85 83 74 62 79 74 62 79 74 81 83 65 81 83 65 67 69 58 82 23 | UR % 67 47 71 73 63 63 64 59 67 88 73 77 59 79 79 73 69 69 | TL (μm) 563 426 519 542 501 637 424 485 461 541 541 543 576 557 508 527 508 527 509 531 | TW (μm) 26 24 27 23 26 24 28 24 28 24 26 21 24 23 25 24 21 24 21 24 26 | TWT (μm) 3.7 3.2 3.3 3.1 2.8 3.5 2.8 3.5 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.7 |
| Urmm 19 15 20 19 15 20 19 23 21 17 17 19 22 19 19 19 22 19 19 19 23 21 17 17 19 15 20 21 17 19 22 21 19 19 22 21 19 19 22 21 19 19 22 21 19 19 22 21 19 19 22 21 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 19 22 22 19 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 22 19 19 22 24 19 22 24 19 22 24 19 22 24 19 22 24 19 22 24 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 636 623 573 585 546 533 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 722 735 647 680 688 722 735 647 680 688 722 667 | FW (μm) 18 18 19 18 20 19 21 19 21 19 19 17 18 19 19 17 17 18 19 17 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.1 3.4 2.8 3.6 3.5 3.5 3.5 3.4 3.7 4.2 | LL (μm) 862 855 928 963 910 911 851 858 832 842 885 919 918 837 868 862 862 862 8785 | LW (μm) 20 19 19 21 20 20 20 20 20 20 20 17 21 19 18 17 18 17 18 17 21 | LWT (μm) 4.3 857 4.2 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.3 4.3 3.5 3.6 3.9 4.7 4.2 | SP % 66 73 85 83 74 62 79 74 62 79 74 75 81 83 65 67 69 58 82 73 67 | UR % 47 71 73 78 63 64 59 67 88 73 77 59 73 79 73 69 69 69 88 | TL (μm) 563 426 519 542 501 637 424 485 461 543 576 557 508 527 509 531 494 | TW (μm) 26 24 27 23 26 24 28 24 28 24 26 21 24 23 25 24 21 24 21 24 23 25 24 21 24 23 | TWT (μm) 3.7 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.4 2.5 3.3 3.7 2.9 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 17 17 19 16 22 19 17 19 17 19 23 21 17 19 23 21 17 19 23 21 19 22 29 19 23 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 23 21 19 22 21 29 19 22 21 29 29 29 20 29 29 29 29 29 29 29 29 29 29 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 636 623 573 585 546 531 533 585 546 531 533 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 722 735 647 880 688 722 735 647 880 688 722 667 713 | FW (μm) 18 18 19 18 20 19 21 19 21 19 19 19 17 18 19 17 17 18 19 17 7 7 7 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.1 3.4 2.8 3.6 3.5 3.5 3.5 3.5 3.4 3.7 4.2 4.0 3.4 | LL (μm) 862 855 928 963 910 911 851 858 832 842 842 842 845 919 918 837 868 862 892 785 887 | LW (μm) 20 19 19 21 20 20 20 20 20 20 20 20 20 20 20 17 21 19 18 17 18 17 18 17 18 17 21 20 20 20 20 20 20 20 20 20 20 20 20 20 | LWT (μm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 4.3 3.5 3.6 3.3 4.3 4.3 4.3 3.5 3.6 3.9 4.7 4.2 3.7 | SP % 66 73 85 83 74 62 79 74 75 81 83 65 65 67 69 58 82 73 67 75 | UR % 47 71 73 78 63 64 59 67 88 73 77 59 79 73 69 69 88 83 | TL (μm) 563 426 519 542 501 637 424 485 461 541 543 576 557 508 527 509 531 494 582 | TW (μm) 26 24 27 23 26 24 28 24 28 24 26 21 24 23 25 24 21 24 24 22 24 22 23 25 24 21 24 23 25 24 21 24 23 25 24 23 25 24 23 26 24 27 23 26 24 27 23 26 24 27 23 26 24 27 23 26 24 27 23 26 24 27 23 26 24 27 23 26 24 27 23 26 24 27 23 26 24 24 27 23 26 24 24 27 23 26 24 24 27 26 24 24 27 26 24 24 26 24 24 27 26 24 24 26 24 24 26 24 24 26 24 24 26 24 26 24 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 22 22 22 22 24 22 22 22 22 22 22 22 | TWT (μm) 3.7 3.2 3.3 3.1 2.8 3.5 2.8 3.5 2.8 3.5 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.7 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.7 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 22 19 19 16 22 19 16 22 19 23 21 17 19 22 23 21 17 19 23 21 17 20 20 20 20 20 21 20 20 20 20 20 21 20 20 20 20 20 20 20 20 20 20 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 638 473 517 520 539 617 636 623 573 585 546 531 533 683 576 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 678 722 735 647 680 688 722 735 647 680 688 722 735 647 | FW (μm) 18 18 19 18 20 19 21 19 21 19 19 17 17 18 19 17 17 18 19 17 17 17 | FWT (µm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 3.4 3.5 3.5 3.4 3.7 4.2 4.0 3.7 | LL (μm) 862 855 928 963 910 911 851 858 832 842 885 919 918 837 868 837 868 862 892 785 887 070 | LW (μm) 20 19 19 21 20 20 20 20 20 20 17 21 19 18 17 18 17 18 17 21 20 18 | LWT (µm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.9 4.7 4.2 3.7 3.9 | SP % 66 73 85 83 74 62 79 74 75 81 83 65 67 69 58 82 73 67 75 57 | UR % 47 71 73 63 64 59 67 88 73 77 59 79 73 69 69 88 88 83 83 74 | TL (μm) 563 426 519 542 501 637 424 461 541 541 541 541 541 541 543 576 557 508 527 508 527 509 531 494 582 505 | TW (μm) 26 24 27 23 26 24 28 24 26 21 24 23 25 24 21 24 21 24 21 24 21 24 22 325 24 21 24 22 325 24 21 22 325 24 27 23 26 24 27 23 26 24 27 23 26 24 27 23 26 24 27 23 26 24 27 23 26 24 27 23 26 24 27 23 26 24 27 23 26 24 27 23 26 24 24 27 23 26 24 24 27 23 26 24 24 27 23 26 24 24 27 26 24 24 26 24 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 24 26 21 24 26 24 24 26 24 26 24 26 24 26 24 26 24 26 24 26 22 26 24 26 24 26 22 22 22 22 22 22 22 22 22 22 22 22 | TWT (μm) 3.7 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.4 2.5 3.3 3.7 2.9 3.1 |
| Urmm 19 15 20 19 23 21 17 17 19 22 21 17 19 22 19 19 22 19 19 22 19 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 22 19 23 21 17 19 22 22 19 22 21 17 19 22 22 19 22 21 17 19 22 22 19 22 21 17 19 22 22 21 17 17 17 17 17 17 17 17 17 1 | VEL (μm) 632 644 647 603 537 638 473 517 520 533 617 638 623 573 585 546 531 533 683 576 533 683 578 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 722 735 647 680 688 722 735 647 680 688 722 667 713 715 735 | FW (μm) 18 18 19 18 20 19 21 19 21 19 17 17 18 19 17 17 17 17 17 17 21 17 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 3.5 3.4 3.5 3.5 3.4 3.7 4.2 4.0 3.4 3.7 4.3 | LL (μm) 862 855 928 963 910 911 851 858 852 842 885 919 918 837 868 837 868 852 892 785 887 870 805 | LW (μm) 20 19 19 21 20 20 20 20 20 20 20 20 17 21 19 18 17 18 17 18 17 18 17 18 17 21 20 18 20 19 | LWT (µm) 4.3 857 4.2 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 4.3 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.4 | SP % 66 73 85 83 74 62 79 74 62 79 74 81 83 65 67 69 58 82 73 67 75 68 | UR % 47 71 73 63 64 59 67 88 73 77 59 79 73 69 69 88 83 74 52 | TL (μm) 563 426 519 542 501 637 424 485 461 541 541 543 576 508 527 508 527 508 527 508 527 509 531 494 582 555 | TW (μm) 26 24 27 23 26 24 28 24 28 24 26 21 24 23 25 24 21 24 21 24 23 21 24 23 21 27 7 24 | TWT (μm) 3.7 3.2 3.3 3.1 2.8 3.5 2.8 3.5 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.4 2.5 3.3 3.7 2.9 3.1 3.7 |
| Urmm 19 15 20 19 15 20 19 23 21 17 17 19 22 19 19 19 22 19 19 19 23 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 22 19 19 22 21 17 19 22 22 19 19 22 21 17 19 22 22 19 19 24 22 21 19 19 24 23 20 19 19 24 23 20 19 19 24 23 20 19 19 24 23 20 19 19 24 23 20 17 19 19 24 23 20 17 19 19 24 23 20 17 19 19 24 23 20 17 19 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 638 623 573 585 546 623 573 585 546 533 563 576 538 576 538 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 722 735 647 680 688 722 735 647 680 688 722 735 647 680 688 722 735 647 713 715 735 735 | FW (μm) 18 18 19 18 20 19 21 19 17 17 18 19 17 17 18 19 17 17 17 18 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.1 3.4 2.8 3.6 3.5 3.5 3.5 3.4 3.7 4.2 4.0 3.4 3.7 4.3 3.6 | LL (μm) 862 855 928 963 910 911 851 858 832 842 885 919 918 837 868 862 862 862 882 785 887 870 855 877 | LW (μm) 20 19 19 21 20 20 20 20 20 20 20 21 19 18 17 18 17 18 17 21 20 18 20 18 20 18 20 19 21 20 20 20 20 20 20 20 20 20 20 20 20 20 | LWT (µm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.7 4.2 3.7 3.9 4.2 4.2 4.2 4.2 4.2 5 7 4.2 4.2 5 7 4.2 4.2 5 7 4.2 4.2 4.2 5 7 4.2 4.2 4.2 5 7 4.2 4.2 4.2 4.2 5 7 5 7 4.2 4.2 4.2 5 7 7 4.2 4.2 4.2 4.2 5 7 7 4.2 4.2 4.2 4.2 4.2 4.2 4.2 4.2 4.2 4.2 | SP % 66 73 85 83 74 62 79 74 75 81 83 65 67 69 58 82 73 67 75 67 67 68 64 | UR % 47 71 73 78 63 64 59 67 88 73 77 59 73 69 69 88 83 74 52 27 | TL (μm) 563 426 519 542 501 637 424 485 461 543 576 508 527 508 527 508 527 509 531 494 582 505 555 555 | TW (μm) 26 24 27 23 26 24 28 24 28 24 23 25 24 21 24 25 24 21 24 26 23 21 27 24 24 | TWT (μm) 3.7 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.7 2.9 3.1 3.4 3.6 3.2 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 23 21 17 19 22 19 23 21 17 19 22 19 23 21 17 19 22 20 19 23 21 19 22 21 19 23 21 19 23 21 19 22 21 19 22 21 19 23 21 19 22 21 19 22 21 19 22 20 20 22 20 22 20 22 20 22 22 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 636 623 573 520 539 617 636 623 573 585 546 531 533 683 576 598 570 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 722 735 647 680 688 722 735 647 713 715 735 675 675 601 | FW (μm) 18 18 19 18 20 19 21 19 19 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 | FWT (μm) 3.9 3.8 3.8 3.8 3.4 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 3.5 3.5 3.5 3.5 3.5 3.7 4.2 4.0 3.7 4.2 4.0 3.7 4.3 3.6 3.5 | LL (μm) 862 855 928 963 910 911 851 858 832 842 842 842 842 842 842 842 842 842 84 | LW (μm) 20 19 19 21 20 20 20 20 20 20 20 17 21 19 18 17 18 17 18 17 21 20 18 17 21 20 20 20 20 20 20 20 20 20 20 20 20 20 | LWT (µm) 4.3 857 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 4.3 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.7 4.2 3.7 3.9 4.4 4.2 3.7 3.9 4.4 4.2 3.7 3.9 4.2 4.2 4.2 4.2 4.2 4.2 4.2 4.2 4.2 4.2 | SP % 66 73 85 83 74 62 79 74 75 81 83 65 67 69 58 82 73 67 67 67 67 68 84 82 73 | UR % 47 71 73 63 64 59 67 88 73 77 59 73 69 69 69 88 83 74 52 72 29 | TL (μm) 563 426 519 542 501 637 424 485 461 541 541 543 576 557 508 527 509 531 494 582 505 555 508 | TW (μm) 26 24 27 23 26 24 28 24 26 21 24 26 21 24 25 24 21 24 26 23 21 27 24 24 22 24 22 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 2.8 3.5 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.7 2.9 3.1 3.4 3.6 3.2 3.2 3.4 3.2 3.4 3.4 3.6 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 22 19 19 22 19 19 22 19 22 19 22 19 22 21 17 19 22 21 17 19 22 20 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 19 22 21 17 19 22 21 17 19 22 21 19 22 21 17 19 22 21 19 22 21 17 19 22 21 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 24 23 20 17 19 24 20 17 19 24 20 17 19 24 20 17 19 24 20 17 19 24 20 17 19 24 20 17 19 24 20 17 19 24 20 17 19 24 20 17 19 24 20 17 19 24 20 17 19 24 20 17 19 24 20 19 24 20 19 24 20 19 24 20 19 24 20 19 24 20 19 24 20 19 24 24 20 19 24 24 20 19 24 24 25 19 24 24 25 19 24 24 25 19 24 25 19 24 25 19 24 25 19 24 25 19 24 25 19 24 25 19 24 25 19 24 25 19 24 25 19 26 19 19 26 19 19 19 24 26 19 19 19 24 26 19 19 19 19 19 24 19 19 19 24 19 19 19 19 19 19 19 19 19 19 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 638 623 573 585 546 531 533 683 576 5588 538 576 5588 538 576 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 678 678 722 735 647 680 688 722 735 647 680 688 722 735 647 680 667 713 715 735 667 691 602 | FW (μm) 18 18 19 18 20 19 21 19 21 19 19 17 17 18 19 17 17 18 19 17 17 17 17 17 17 17 17 | FWT (µm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 3.4 3.5 3.5 3.4 3.5 3.5 3.4 3.7 4.2 4.0 3.4 3.7 4.2 3.6 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | LL (μm) 862 855 928 963 910 911 851 858 832 842 885 919 918 837 868 837 868 837 868 862 892 785 887 870 895 827 850 827 850 | LW (μm) 20 19 19 21 20 20 20 20 20 20 20 20 17 21 19 18 17 18 17 18 17 21 20 18 20 19 22 20 17 | LWT (µm) 4.3 857 4.2 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.9 4.7 4.2 3.7 4.2 3.7 4.2 4.3 4.3 4.3 4.3 4.3 4.3 4.3 4.3 4.3 5 3.6 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | SP % 66 73 85 83 74 62 79 74 75 81 83 65 67 69 58 82 73 67 75 67 68 64 82 73 67 | UR % 67 47 71 73 63 64 59 67 88 73 77 59 79 73 69 69 88 83 74 52 72 81 65 | TL (μm) 563 426 519 542 501 637 424 485 461 541 541 541 543 576 557 508 527 508 527 509 531 494 582 505 555 508 510 440 | TW (μm) 26 24 27 23 26 24 28 24 26 21 24 23 25 24 21 24 21 24 21 24 21 24 22 23 21 27 24 24 22 23 21 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.7 2.9 3.1 3.4 3.6 3.2 4.1 3.6 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 19 22 19 19 22 19 19 22 19 19 22 19 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 19 22 21 17 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 24 23 20 17 19 22 24 23 20 21 19 22 24 23 20 27 19 22 24 23 20 27 27 27 27 27 27 27 27 27 27 | VEL (μm) 632 644 647 603 537 638 473 517 520 533 617 636 623 573 585 546 623 573 585 546 533 683 576 538 558 553 538 553 538 553 538 553 538 553 553 | FL (μm) 750 749 722 761 622 676 614 648 678 722 751 647 680 688 722 667 713 715 675 691 607 625 | FW (μm) 18 18 19 18 20 19 21 19 21 19 19 17 17 18 19 17 17 17 18 19 17 17 17 17 18 17 17 18 17 17 18 17 17 | FWT (μm) 3.9 3.8 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 3.5 3.4 3.5 3.4 3.7 4.2 4.0 3.4 3.7 4.2 3.6 3.5 3.2 3.6 3.5 3.2 3.2 | LL (μm) 862 855 928 963 910 911 851 858 842 885 919 918 837 868 862 887 887 887 870 895 827 850 725 | LW (μm) 20 19 19 20 20 20 20 20 20 20 20 20 20 17 21 19 18 17 18 17 18 17 18 17 21 20 18 20 19 22 20 18 20 5 5 | LWT (µm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.9 4.2 3.7 3.9 4.2 4.2 3.7 3.9 4.2 4.2 3.7 3.9 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 4.3 3.5 3.6 3.9 4.2 4.2 4.2 5 3.6 5 3.6 3.3 4.3 4.3 4.3 5 5 3.6 5 3.6 3.3 4.2 4.2 4.2 5 3.6 5 3.7 7 3.9 4.2 4.2 8 3.5 3.6 5 3.6 5 3.6 5 3.6 5 3.6 5 3.7 7 3.9 4.2 4.2 3.5 3.6 5 3.6 5 3.6 5 3.6 5 3.7 7 3.9 4.2 4.2 5 3.6 5 3.6 5 3.6 5 3.6 5 3.6 5 3.7 7 3.9 4.2 4.2 5 3.6 5 3.6 5 3.7 7 3.7 7 3.9 4.2 4.2 5 3.6 5 3.6 5 3.6 5 3.7 7 3.7 7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 | SP % 66 73 85 83 74 62 79 74 62 79 74 81 83 65 67 69 58 82 73 67 58 82 73 67 75 67 68 64 82 71 77 | UR % 47 71 73 63 64 59 67 88 73 77 59 79 73 69 69 88 83 74 52 72 81 66 | TL (μm) 563 426 519 542 501 637 424 485 461 541 541 543 576 508 527 508 527 508 527 508 527 508 527 508 527 508 527 508 527 508 527 508 527 508 527 508 527 508 527 508 527 509 531 542 542 542 542 542 542 542 542 542 542 | TW (μm) 26 24 27 23 26 24 28 24 28 24 23 24 21 24 23 25 24 21 24 23 21 27 24 24 23 22 23 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.4 2.5 3.3 3.7 2.9 3.1 3.4 3.6 3.2 4.1 2.8 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 23 21 17 17 19 22 19 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 19 23 21 17 17 19 22 23 21 17 19 22 23 21 17 17 19 22 23 21 19 23 21 19 23 21 19 23 21 19 23 21 19 23 21 19 22 21 19 22 21 19 22 21 19 22 22 19 23 21 19 19 22 22 19 23 21 19 19 22 22 19 19 22 22 19 23 22 19 19 22 22 19 22 22 19 19 22 22 19 22 22 19 19 19 22 22 20 19 19 22 22 23 22 19 22 24 19 19 24 23 20 17 19 24 23 20 17 19 24 23 20 17 19 24 23 20 19 19 24 24 23 20 19 19 24 24 19 24 24 24 24 19 24 24 19 24 24 19 24 24 19 24 24 19 24 24 19 24 24 19 24 24 19 24 24 19 24 24 19 24 24 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 19 24 17 17 17 17 17 19 24 17 17 17 17 17 17 17 17 17 17 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 638 623 573 546 531 533 546 531 533 546 531 533 546 531 533 576 598 538 5770 480 536 520 529 | FL (μm) 750 749 722 761 622 676 614 648 678 722 751 622 676 614 648 678 722 735 647 680 688 722 667 713 715 735 691 607 626 617 | FW (μm) 18 18 19 18 20 19 21 19 19 17 18 19 19 17 17 18 19 17 17 18 19 17 17 18 17 17 17 18 17 17 | FWT (μm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.1 3.4 2.8 3.6 3.5 3.5 3.4 3.7 4.2 4.0 3.4 3.7 4.2 4.0 3.4 3.7 4.3 3.6 3.5 3.2 3.0 2.4 | LL (μm) 862 855 928 963 910 911 851 858 832 842 885 919 918 837 868 862 882 785 887 870 885 887 870 885 887 870 895 827 850 730 730 | LW (μm) 20 19 19 21 20 20 20 20 20 20 20 20 21 19 18 17 18 17 18 17 21 20 18 20 18 20 19 22 20 15 16 | LWT (µm) 4.3 857 4.2 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.3 4.3 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.4 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.3 4.3 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.3 4.3 4.3 4.3 4.3 4.3 4.3 4.3 4.3 4.3 | SP % 66 73 85 83 74 62 79 74 75 81 83 65 67 75 69 58 82 73 69 58 82 73 67 75 67 68 82 73 67 75 67 75 67 75 67 75 67 75 75 75 75 75 73 81 73 74 75 81 73 81 74 73 74 74 75 81 74 75 81 74 75 81 74 75 81 74 75 81 83 74 75 81 81 75 81 81 83 74 75 81 81 83 83 74 75 81 81 83 83 83 74 74 75 81 83 83 74 75 81 81 83 83 74 75 81 81 83 83 83 83 83 74 75 81 83 83 83 74 75 81 83 83 83 83 83 83 83 83 83 83 83 83 83 | UR % 47 71 73 78 63 64 59 67 88 73 77 59 73 69 69 69 88 83 74 52 72 81 66 88 83 | TL (μm) 563 426 519 542 501 637 424 485 461 543 576 557 508 527 509 531 494 582 505 555 508 510 449 478 510 | TW (μm) 26 24 27 23 26 24 28 24 28 24 26 21 24 23 25 24 21 24 26 23 21 27 24 23 21 27 24 23 22 23 22 23 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.7 2.9 3.1 3.4 3.6 3.2 9 4.1 2.8 2.8 3.2 3.2 3.2 3.1 2.9 3.1 3.4 3.2 3.2 3.2 3.1 2.8 3.1 3.2 3.2 3.2 3.1 3.1 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 |
| Urmm 19 15 20 19 23 21 17 19 22 23 21 17 19 22 19 23 21 17 19 22 19 23 21 17 19 22 20 19 23 21 17 19 22 20 19 23 21 17 19 22 20 19 23 21 17 19 22 20 19 23 21 17 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 21 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 24 23 20 17 19 24 23 20 17 19 24 24 19 24 25 19 24 25 19 24 25 19 24 25 19 24 25 19 25 19 25 26 19 27 26 19 27 27 19 27 27 19 27 27 19 27 27 19 27 27 19 27 27 19 19 19 19 19 19 19 19 19 19 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 638 623 577 636 623 573 585 546 531 533 683 576 598 538 576 598 538 576 598 538 576 598 538 577 538 577 538 577 538 577 538 577 538 577 538 577 538 577 538 577 538 577 538 577 538 577 538 577 537 537 537 537 537 537 537 537 537 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 722 735 647 680 688 722 667 713 715 735 675 691 607 626 645 | FW (μm) 18 18 19 18 20 19 21 19 21 19 19 17 17 18 19 17 17 17 17 17 17 17 17 17 17 17 17 17 | FWT (µm) 3.9 3.8 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 3.5 3.4 3.5 3.5 3.4 3.5 3.5 3.4 3.7 4.2 4.0 3.4 3.6 3.5 3.5 3.4 3.5 3.5 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | LL (μm) 862 855 928 963 910 911 851 858 832 842 842 842 842 842 842 842 843 918 837 868 862 892 785 87 870 895 827 850 730 755 830 | LW (μm) 20 19 19 21 20 20 20 20 20 20 20 20 17 21 19 18 17 21 21 20 18 21 20 18 17 21 20 18 17 21 20 20 17 5 16 18 | LWT (µm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.3 4.3 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | SP % 666 73 85 83 74 62 79 74 75 81 83 65 67 69 58 82 73 67 69 58 82 73 67 67 68 64 82 71 77 58 | UR % 47 71 73 63 64 59 67 88 73 77 59 79 73 69 69 88 83 74 52 72 81 66 88 83 74 52 72 81 66 88 67 77 | TL (μm) 563 426 519 542 501 637 424 485 461 541 543 576 557 508 527 508 527 508 527 509 531 494 582 505 555 505 555 508 510 449 478 563 | TW (μm) 26 24 27 23 26 24 28 24 26 21 24 26 21 24 23 25 24 21 24 22 23 21 27 24 24 22 23 22 23 23 23 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.4 2.5 3.3 3.7 2.9 3.1 3.4 3.6 3.2 4.1 2.8 2.8 3.2 3.2 3.2 3.1 2.9 2.8 3.1 2.9 2.8 3.0 3.1 2.9 2.8 3.0 3.1 2.9 2.8 3.0 3.1 2.9 2.8 3.0 3.1 2.9 2.8 3.0 3.1 2.9 2.8 3.0 3.1 2.9 2.8 3.0 3.1 2.9 2.8 3.0 3.1 2.9 2.8 3.0 3.1 2.9 2.8 3.0 3.1 2.9 2.8 3.0 3.1 2.9 2.8 3.0 3.1 2.9 2.8 3.0 3.1 2.9 2.8 3.0 3.1 3.1 2.9 2.8 3.0 3.1 2.9 2.8 3.0 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 |
| Urmm 19 15 20 19 23 21 17 19 22 19 19 22 19 19 22 19 19 22 19 22 19 22 19 22 19 22 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 19 22 21 17 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 21 19 22 20 19 22 21 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 24 23 20 17 19 24 23 17 19 24 23 17 19 24 23 17 19 24 23 17 19 24 23 17 19 24 23 17 19 24 23 17 19 24 23 17 19 24 23 17 19 24 23 17 19 24 23 17 19 24 23 17 19 23 17 19 23 17 19 23 17 19 23 17 19 23 17 19 23 17 19 23 17 19 23 17 19 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 638 623 573 585 546 531 533 683 576 538 558 538 558 558 558 558 558 558 558 | FL (μm) 750 749 722 761 762 676 614 648 678 722 761 622 676 614 648 678 722 735 647 680 688 722 735 647 667 713 715 735 675 691 607 626 645 671 | FW (μm) 18 18 19 18 20 19 21 19 21 19 17 18 19 17 17 18 19 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 17 17 17 18 17 17 17 18 17 17 17 17 17 17 17 17 17 17 | FWT (µm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 3.4 2.8 3.6 3.5 3.4 3.7 4.2 4.0 3.4 3.7 4.2 3.6 3.5 3.4 3.5 3.5 3.4 3.5 3.5 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | LL (μm) 862 855 928 963 910 911 851 858 832 842 885 919 918 837 868 837 868 837 868 837 862 892 785 887 870 895 827 850 730 755 830 755 | LW (μm) 20 19 19 21 20 20 20 20 20 20 17 21 19 18 17 18 17 18 17 18 17 21 20 18 20 19 22 20 15 16 18 18 18 | LWT (µm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 4.2 3.5 3.6 3.3 4.3 4.3 4.3 4.3 3.5 3.6 3.9 4.2 4.2 5 3.6 3.3 4.3 4.3 4.3 4.3 4.3 4.3 4.3 4.3 4.3 | SP % 66 73 85 83 74 62 79 74 75 81 83 65 67 69 58 82 73 67 75 67 67 68 64 82 71 77 58 67 77 58 70 77 | UR % 67 47 71 73 63 64 59 67 88 73 77 59 79 73 69 69 88 83 74 59 79 73 69 88 83 74 59 72 81 66 88 83 74 52 72 81 66 88 67 72 72 81 66 88 72 72 72 81 66 72 72 72 72 81 72 72 72 72 73 73 73 73 73 73 73 73 73 73 73 73 73 | TL (μm) 563 426 519 542 501 637 424 485 461 541 541 541 543 576 557 508 527 508 527 509 531 494 582 505 555 508 510 494 478 563 514 462 | TW (μm) 26 24 27 23 26 24 28 24 28 24 26 21 24 23 25 24 21 24 23 21 27 24 24 23 21 27 24 24 23 22 23 23 23 23 23 23 | TWT (μm) 3.7 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.4 2.5 3.3 3.7 2.9 3.1 3.4 3.6 3.2 4.1 2.8 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.1 2.8 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 19 22 19 19 22 19 19 22 19 19 22 19 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 19 22 21 17 19 22 21 19 22 21 17 19 22 21 19 24 23 20 17 18 19 24 23 20 17 18 19 24 23 20 17 19 24 23 20 17 18 19 24 23 20 17 19 24 23 20 17 19 24 23 20 17 19 24 23 20 17 19 24 23 20 17 19 24 23 20 17 19 24 23 20 17 19 24 23 20 17 19 23 21 17 19 24 23 20 17 18 18 18 19 24 23 20 17 18 18 18 19 24 23 20 17 18 18 18 19 24 23 20 17 18 18 19 24 23 17 18 18 18 19 24 17 18 18 19 24 17 18 18 19 23 17 18 18 19 23 17 18 18 19 23 17 18 18 19 23 17 18 18 19 23 17 18 19 24 19 24 19 25 17 18 18 19 19 24 17 18 18 18 19 19 19 19 19 19 19 19 19 19 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 636 623 573 585 546 533 683 576 538 538 576 538 5770 480 536 553 469 | FL (μm) 750 749 722 761 622 676 614 648 678 722 751 622 676 614 648 678 722 735 647 680 688 722 667 713 715 635 691 607 626 645 671 624 | FW (μm) 18 18 19 18 20 19 21 19 21 17 18 19 17 17 18 19 17 17 18 17 17 18 17 17 18 17 17 18 19 17 18 19 19 18 20 19 21 19 17 18 19 19 17 18 19 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 17 17 17 18 17 17 17 18 17 17 17 17 17 17 17 17 17 17 | FWT (μm) 3.9 3.8 3.8 3.8 3.8 3.8 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 3.5 3.4 3.7 4.2 4.0 3.4 3.7 4.2 4.0 3.4 3.7 4.2 3.6 3.5 3.5 3.4 3.7 3.6 3.5 3.5 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | LL (μm) 862 855 928 963 910 911 851 858 842 885 919 918 837 868 862 892 785 887 870 895 827 850 730 755 830 791 796 | LW (μm) 20 19 19 20 20 20 20 20 20 20 20 21 17 21 19 18 17 18 17 18 17 21 20 18 20 19 22 20 15 16 18 18 20 20 20 20 20 20 20 20 20 20 20 20 20 | LWT (µm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.7 4.2 3.7 3.9 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.9 4.7 4.2 4.2 5 5 3.6 3.3 4.3 4.3 3.5 5 3.6 3.9 4.7 4.2 4.2 5 5 3.6 5 3.6 3.3 4.3 4.3 4.3 4.3 5 5 3.6 3.6 3.9 4.7 4.2 4.2 4.2 4.2 4.2 4.2 5 5 3.6 5 3.6 5 3.3 4.3 4.3 4.3 4.3 5 5 3.6 3.3 4.3 4.3 4.2 4.2 5 3.6 5 3.6 5 3.6 6 3.9 4.7 7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 5 3.6 3.7 3.7 3.9 4.7 3.9 4.7 3.9 4.7 4.7 3.9 4.7 3.9 4.7 4.7 3.9 4.7 4.7 3.9 4.7 3.9 4.7 3.7 3.7 3.9 4.7 4.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3 | SP % 66 73 85 83 74 62 79 74 75 81 83 65 67 69 58 82 73 67 75 67 68 64 82 71 75 67 75 67 75 67 75 58 70 67 77 77 77 | UR % 47 71 73 78 63 64 59 67 88 73 77 59 79 73 69 69 88 83 74 52 72 81 66 88 83 74 52 72 81 66 88 67 71 | TL (μm) 563 426 519 542 501 637 424 485 461 541 543 576 508 527 508 527 509 531 494 582 505 555 508 510 449 478 563 514 465 | TW (μm) 26 24 27 23 26 24 28 24 28 24 23 24 23 25 24 21 24 23 21 27 24 23 21 27 24 23 22 23 23 23 23 25 25 | TWT (μm) 3.7 3.2 3.3 3.1 2.8 3.0 2.8 3.0 3.3 3.1 2.8 3.0 3.3 3.4 2.5 3.3 3.7 2.9 3.1 3.4 3.6 3.2 4.1 2.8 2.9 3.4 3.6 3.2 4.1 2.8 2.9 3.4 3.6 3.2 4.1 2.8 2.9 3.4 3.5 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 23 21 17 17 19 22 19 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 19 22 23 21 17 17 19 22 23 21 17 19 22 23 21 19 23 21 17 19 22 23 21 19 22 23 21 19 22 23 21 19 22 23 21 19 22 23 21 19 22 23 21 19 22 23 21 19 22 23 21 19 22 23 21 19 22 23 21 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 18 19 24 23 20 17 19 24 23 20 17 19 24 23 20 17 19 24 19 23 20 17 18 19 24 19 23 20 17 18 19 24 19 23 20 17 18 19 24 19 23 20 17 18 18 19 24 19 23 20 17 18 18 19 24 19 23 20 17 18 18 19 24 18 19 24 19 23 20 17 18 18 19 24 18 19 24 18 19 24 18 19 24 18 19 24 18 19 24 18 19 24 18 18 18 18 19 24 18 18 18 18 19 24 18 18 18 18 18 18 18 19 18 18 18 18 18 19 18 18 18 18 19 18 18 18 18 19 18 18 18 18 18 19 18 18 18 19 18 18 18 19 19 24 18 18 18 18 18 19 18 18 19 18 18 19 19 18 18 18 18 19 18 18 18 19 18 18 18 18 18 18 18 18 18 18 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 636 623 573 585 546 531 533 683 576 598 536 570 480 536 5583 5553 469 546 553 | FL (μm) 750 749 722 761 747 761 622 676 614 648 678 722 735 647 680 688 722 667 713 715 675 691 607 626 645 671 634 676 | FW (μm) 18 18 19 18 20 19 21 19 21 19 17 18 19 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 19 21 19 19 17 19 19 17 19 19 17 19 19 17 18 19 19 17 19 19 17 18 19 19 17 18 19 19 17 18 19 19 17 18 19 19 17 18 19 17 18 19 17 18 19 17 18 19 17 18 19 17 17 18 17 17 18 17 15 17 18 15 17 18 15 17 18 15 17 18 19 15 17 18 15 17 18 19 15 17 18 18 20 17 18 19 17 17 18 17 17 18 17 17 18 19 18 17 17 18 17 17 18 17 18 17 17 18 18 20 17 17 18 18 20 17 17 18 18 20 17 17 18 18 20 17 17 18 18 20 17 17 18 20 17 18 20 17 17 18 20 17 18 20 18 20 19 18 20 20 18 20 17 18 20 19 18 20 20 17 18 20 18 20 20 18 20 20 19 18 20 20 20 20 17 17 18 20 20 18 20 20 17 17 18 20 20 18 20 18 20 17 17 18 20 20 17 18 20 20 17 18 20 17 17 18 20 18 20 17 17 18 20 18 20 17 17 18 20 20 18 20 17 18 20 18 20 17 18 20 19 18 20 19 18 20 19 18 20 19 18 20 19 18 20 19 18 20 19 18 20 19 18 20 19 18 20 19 18 20 19 18 20 19 18 20 19 18 20 19 18 18 19 18 18 18 18 19 19 18 18 19 18 18 19 18 18 19 18 18 19 18 18 19 18 18 19 18 18 19 18 18 19 18 18 19 18 18 19 18 18 18 18 19 18 18 19 18 18 19 18 18 18 19 18 18 19 18 18 18 19 18 18 18 19 18 18 18 19 18 18 18 18 18 18 18 18 18 18 | FWT (μm) 3.9 3.8 3.8 3.8 3.4 3.6 3.5 3.1 3.1 3.1 3.4 2.8 3.6 3.5 3.5 3.5 3.5 3.5 3.5 3.7 4.2 4.0 3.4 3.7 4.2 4.0 3.4 3.7 4.3 3.6 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | LL (μm) 862 855 928 963 910 911 851 858 832 842 842 842 842 842 842 842 842 842 84 | LW (μm) 20 19 19 21 20 20 20 20 20 20 17 21 19 18 17 18 17 21 20 18 17 21 20 20 20 17 5 16 18 18 20 22 20 22 20 20 20 20 20 20 20 20 20 | LWT (µm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 4.3 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.4 4.2 3.7 3.9 4.4 4.2 3.7 3.9 4.4 4.2 3.7 3.9 4.1 3.5 3.6 3.9 4.2 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.5 3.6 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.7 3.9 4.7 4.2 3.5 3.6 3.5 3.5 3.6 3.7 3.9 4.7 4.2 3.5 3.6 3.5 3.6 3.7 3.9 4.7 4.2 3.5 3.6 3.5 3.6 3.7 3.9 4.7 4.2 3.7 3.9 4.7 4.2 3.5 3.6 3.5 3.6 3.7 3.5 3.6 3.7 3.7 3.9 4.7 4.2 3.7 3.9 4.7 4.2 3.7 3.5 3.6 3.7 3.7 3.7 3.7 3.7 3.9 4.7 4.2 3.7 3.7 3.9 4.7 4.2 3.7 3.7 3.9 4.7 4.2 3.7 3.7 3.9 4.4 4.2 3.7 3.0 3.0 3.7 3.7 3.0 3.0 4.2 3.7 3.0 3.5 3.6 3.7 3.7 3.0 3.0 3.7 3.0 3.5 3.6 3.7 3.7 3.0 3.5 3.6 3.7 3.7 3.0 3.5 3.6 3.7 3.7 3.0 3.0 3.5 3.5 3.6 3.5 3.5 3.6 3.7 3.5 3.5 3.5 3.6 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | SP % 66 73 85 83 74 62 79 74 75 81 83 65 67 75 81 83 65 67 75 68 82 73 67 75 67 68 82 73 67 75 58 70 67 72 58 70 | UR % 47 71 73 78 63 64 59 67 88 73 77 59 79 73 69 69 69 88 83 74 52 72 81 66 88 83 74 52 72 81 66 88 67 71 53 | TL (μm) 563 426 519 542 501 637 424 485 461 541 541 543 576 557 508 527 509 531 494 582 505 555 508 510 449 478 563 514 465 524 | TW (μm) 26 24 27 23 26 24 28 24 26 21 24 26 21 24 25 24 21 24 26 23 25 24 21 27 24 24 22 23 22 23 23 23 25 28 26 23 25 28 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.7 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.7 2.9 3.1 3.4 3.6 3.2 4.1 2.8 2.9 3.1 3.4 3.2 3.2 3.2 3.3 3.7 3.7 3.2 3.1 2.8 3.0 3.1 3.1 2.9 3.1 3.4 3.5 3.2 3.2 3.1 3.1 3.1 2.9 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 23 21 17 19 22 19 23 21 17 19 22 19 23 21 17 19 22 20 19 23 21 17 19 22 20 19 23 21 17 19 22 20 19 23 21 17 19 22 20 19 23 21 17 19 22 20 19 23 21 17 19 22 20 19 23 21 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 24 23 17 18 19 24 23 17 18 18 13 19 24 23 17 18 13 19 24 23 25 17 18 18 13 19 24 23 17 18 18 13 19 24 23 17 18 18 13 19 22 23 17 18 18 13 19 22 23 17 18 18 19 22 22 23 17 18 18 19 22 22 23 17 18 18 19 22 22 23 17 18 18 19 22 23 17 18 18 19 22 23 17 18 18 19 24 25 19 19 25 19 19 25 19 25 19 25 19 25 19 19 25 19 19 25 19 25 19 19 25 19 19 25 19 15 19 19 15 15 15 15 15 15 15 15 15 15 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 636 623 573 585 546 531 533 663 576 538 535 536 538 536 538 536 538 536 538 536 536 536 536 536 536 536 537 638 537 638 538 538 536 538 536 536 538 537 538 537 538 538 537 538 537 538 537 538 537 538 537 538 537 537 539 537 537 539 537 537 539 537 537 539 537 537 539 537 537 539 537 537 539 537 539 537 537 537 538 546 531 537 537 538 546 531 537 537 538 537 537 538 546 531 537 538 537 537 538 537 538 537 537 538 537 537 538 537 537 538 537 538 537 538 537 538 537 538 537 538 537 538 537 537 538 537 537 538 546 531 537 538 537 537 538 537 537 538 546 533 537 537 538 537 537 538 537 537 538 537 537 538 537 538 537 537 538 537 537 538 536 536 538 537 537 538 536 536 538 537 537 538 536 536 538 537 536 538 536 536 536 536 536 536 536 536 536 536 | FL (μm) 750 749 722 761 762 614 648 678 722 761 622 676 614 648 678 722 735 647 680 688 722 667 713 715 735 675 691 607 626 645 671 634 676 679 | FW (μm) 18 18 19 18 20 19 21 19 21 19 17 18 19 17 17 17 18 19 17 17 18 19 17 17 17 18 19 17 17 18 19 17 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 20 17 17 18 20 17 17 18 20 17 17 18 20 17 17 18 20 17 17 18 20 17 17 18 20 17 17 18 20 17 17 18 20 17 17 18 20 17 17 18 20 17 17 19 18 20 17 17 17 17 18 20 17 17 17 18 20 17 17 18 20 17 17 18 20 17 17 18 20 17 17 17 18 20 18 20 18 17 17 17 19 18 20 18 18 20 18 18 18 18 18 18 18 18 18 18 | FWT (µm) 3.9 3.8 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 3.4 3.5 3.5 3.4 3.5 3.5 3.4 3.5 3.5 3.4 3.6 3.5 3.5 3.4 3.6 3.5 3.5 3.4 3.5 3.5 3.5 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | LL (μm) 862 855 928 963 910 911 851 858 832 842 885 919 918 837 868 862 887 855 887 855 887 870 885 827 850 730 755 830 791 796 795 804 | LW (μm) 20 19 19 21 20 20 20 20 20 20 17 21 19 18 17 21 20 18 17 21 20 18 20 19 22 20 15 16 18 18 20 22 18 | LWT (µm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 4.3 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 4.3 4.3 3.5 3.6 3.9 4.2 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.2 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.2 4.2 3.5 3.6 3.3 4.3 4.3 4.2 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.5 3.6 3.5 3.6 3.5 3.5 3.6 3.5 3.6 3.5 3.6 3.7 4.2 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.7 4.2 3.5 3.6 3.5 3.6 3.5 3.6 3.7 4.2 3.5 3.6 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.7 4.2 3.7 3.9 4.2 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.7 3.9 4.7 4.2 3.7 3.9 4.7 4.2 3.7 3.9 4.2 3.5 3.6 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 3.6 3.7 3.9 4.2 3.7 3.0 3.0 3.5 3.6 3.0 3.7 3.7 3.9 3.6 3.7 3.9 3.6 3.7 3.0 3.9 3.6 3.7 3.0 3.5 3.7 3.0 3.9 3.6 3.7 3.7 3.9 3.6 3.7 3.7 3.9 3.6 3.7 3.7 3.9 3.6 3.7 3.7 3.9 3.6 3.7 3.7 3.9 3.6 3.7 3.7 3.9 3.6 3.7 3.7 3.9 3.6 3.7 3.7 3.9 3.6 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 | SP % 666 73 85 83 74 62 79 74 75 81 83 65 67 69 58 82 73 67 75 67 68 82 73 67 75 67 68 82 73 67 75 58 70 67 72 58 70 67 72 58 | UR % 47 71 73 63 64 59 67 88 73 77 59 79 73 69 69 88 83 74 52 72 81 66 88 83 74 52 72 81 66 88 83 74 52 72 81 66 88 67 71 73 59 79 73 69 69 88 83 74 75 75 75 79 73 69 69 88 83 74 75 75 75 79 79 73 69 69 88 83 74 75 75 79 79 73 75 79 79 73 75 79 79 73 75 79 79 73 75 79 79 73 75 79 79 73 75 79 79 73 75 79 79 73 75 79 79 73 75 79 79 73 75 79 79 73 75 79 79 73 75 79 79 73 69 69 88 87 74 75 79 79 73 69 69 69 69 88 73 77 75 79 79 73 69 69 88 83 74 75 75 75 75 79 75 79 73 69 69 88 88 73 77 75 79 73 69 69 88 87 75 75 75 75 75 75 75 75 75 75 75 75 75 | TL (μm) 563 426 519 542 501 637 424 485 461 541 541 541 541 543 576 557 508 527 508 527 509 531 494 582 505 555 508 510 494 582 505 555 508 510 494 478 563 514 485 465 524 481 | TW (μm) 26 24 27 23 26 24 28 24 26 21 24 23 25 24 21 24 21 24 23 25 24 21 24 23 21 27 24 24 23 21 22 23 23 23 23 23 23 23 23 23 23 23 23 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.7 2.9 3.1 3.4 3.6 3.2 4.1 2.8 2.8 2.8 3.2 3.2 3.1 2.9 2.8 3.1 3.1 2.9 2.8 3.1 2.9 3.1 3.1 3.1 2.9 3.1 3.1 3.1 3.1 2.9 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 |
| Urmm 19 15 20 19 23 21 17 19 22 19 22 19 19 22 19 19 22 19 19 22 19 22 19 22 19 22 19 22 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 21 17 19 22 20 19 19 22 21 17 19 22 20 19 19 22 21 19 22 20 19 22 21 17 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 23 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 23 17 19 22 23 17 19 22 23 17 19 22 23 17 19 22 23 17 19 22 23 17 19 22 23 17 19 22 23 17 19 22 23 17 19 22 23 17 19 22 23 17 19 22 23 17 19 22 23 17 19 22 23 17 19 22 23 17 19 22 23 17 19 21 20 20 20 20 20 20 20 20 20 20 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 636 623 573 585 546 531 533 683 576 538 573 588 573 585 546 538 570 480 538 553 546 553 546 553 546 553 546 553 546 553 546 553 546 553 546 553 546 553 546 553 546 553 553 553 553 553 553 553 55 | FL (μm) 750 749 722 761 762 761 622 676 614 648 678 722 735 647 680 688 722 667 713 715 735 675 691 607 626 645 671 634 676 679 544 | FW (μm) 18 18 19 18 20 19 21 19 21 19 17 18 19 17 17 18 19 17 17 17 18 17 17 17 18 17 17 18 19 19 17 17 18 19 19 17 17 18 19 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 17 18 19 17 17 17 17 17 18 17 17 17 18 17 17 17 17 17 17 18 17 17 17 17 18 17 17 17 17 17 18 17 17 17 18 17 17 17 17 18 17 17 17 18 17 17 17 18 17 17 17 18 17 17 17 18 17 17 17 18 17 17 17 18 20 18 18 20 18 18 20 18 18 18 18 18 18 18 18 18 18 | FWT (µm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 3.5 3.4 3.5 3.5 3.4 3.7 4.0 3.4 3.7 4.0 3.4 3.5 3.5 3.2 3.0 3.4 3.5 3.5 3.2 3.0 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | LL (μm) 862 855 928 963 910 911 851 858 832 842 885 919 918 837 868 837 868 837 868 837 862 892 785 887 870 895 827 850 730 755 830 791 796 795 884 731 | LW (μm) 20 19 19 20 20 20 20 20 20 20 20 20 20 17 21 19 18 17 18 17 18 17 21 20 18 20 19 22 20 15 16 18 18 18 18 18 20 22 21 20 20 20 20 20 20 20 20 20 20 20 20 20 | LWT (µm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 4.3 3.5 3.6 3.9 4.2 4.2 4.2 5 3.6 3.3 4.3 4.3 4.3 4.3 4.3 4.3 5 3.6 3.9 4.2 4.2 4.2 5 3.6 3.6 3.3 4.3 4.3 4.3 4.3 4.3 4.3 4.3 5 3.6 3.9 4.2 4.2 5 3.6 3.3 4.3 4.3 4.3 4.3 5 3.6 3.9 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 4.3 3.5 3.6 3.9 4.2 4.2 3.7 3.9 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.5 3.6 3.3 3.3 4.3 4.3 3.5 3.6 3.3 3.7 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 3.9 4.2 3.7 3.9 3.9 4.2 3.7 3.9 3.9 4.2 3.7 3.9 3.0 3.0 3.9 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 | SP % 66 73 85 83 74 62 79 74 75 81 83 65 67 69 58 82 73 67 75 67 75 67 75 67 68 64 82 71 77 58 64 82 71 77 58 70 67 77 58 70 67 75 58 70 73 75 81 82 73 75 83 74 75 81 83 74 75 81 83 83 74 75 81 83 74 75 81 83 83 74 75 81 83 83 74 75 81 83 83 74 75 81 83 83 74 75 81 83 83 74 75 81 83 83 74 75 81 83 83 74 75 81 83 83 74 75 81 83 83 83 83 85 83 83 74 75 81 83 83 85 83 83 74 75 81 83 83 85 83 83 85 83 83 85 83 83 85 83 83 85 83 82 75 83 82 75 85 82 75 82 75 85 83 82 75 85 82 73 67 75 85 82 75 85 82 75 75 85 82 77 75 85 82 75 85 83 85 85 85 85 82 75 85 85 85 85 85 85 85 85 85 85 85 85 85 | UR % 47 71 73 63 64 59 67 88 73 77 59 79 73 69 69 88 83 74 59 79 73 69 69 88 83 74 52 72 81 66 88 83 74 52 72 81 66 88 63 63 64 59 73 73 75 79 73 63 63 63 64 77 71 73 78 63 63 64 77 71 73 78 63 64 59 67 73 77 73 78 63 64 59 67 73 77 73 78 63 64 59 67 73 77 73 78 63 64 59 67 73 77 78 63 64 59 67 73 77 79 73 79 79 73 69 69 88 88 73 77 75 79 73 69 69 88 83 74 75 75 79 73 69 69 88 83 74 75 75 75 75 79 73 69 69 88 83 74 75 75 75 75 75 75 75 75 75 75 75 75 75 | TL (μm) 563 426 519 542 501 637 424 485 461 541 543 576 508 527 508 527 509 531 494 582 505 555 508 510 494 582 505 555 508 510 494 582 505 555 508 510 494 582 505 555 508 510 494 563 511 543 512 503 512 503 512 503 512 503 512 503 512 503 512 503 512 503 503 503 503 503 503 503 503 503 503 | TW (μm) 26 24 27 23 26 24 28 24 28 24 26 21 24 23 25 24 21 24 23 21 27 24 23 21 27 24 23 21 27 24 23 23 22 23 23 25 28 24 24 22 23 23 25 28 24 24 27 23 26 24 24 27 23 26 24 24 27 23 26 24 24 27 23 26 24 24 27 23 26 24 24 24 24 27 23 26 24 24 24 24 24 24 24 24 24 24 24 24 24 | TWT (μm) 3.7 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.4 2.5 3.3 3.4 2.5 3.3 3.4 2.5 3.3 3.4 2.5 3.3 3.4 2.9 3.1 3.1 2.9 3.1 2.9 3.1 2.9 3.1 2.9 3.1 2.9 3.1 2.9 3.1 2.9 3.1 2.9 3.1 2.9 3.1 3.1 2.9 3.1 2.9 3.1 3.1 2.9 3.1 3.4 3.5 3.3 3.4 3.5 3.1 3.4 3.5 3.3 3.4 3.7 3.1 3.4 3.5 3.3 3.4 3.7 3.1 3.4 3.5 3.3 3.4 3.7 3.1 3.4 3.2 3.1 3.4 3.1 3.4 3.2 3.3 3.4 3.2 3.1 3.4 3.2 3.3 3.4 3.2 3.3 3.4 3.2 3.3 3.4 3.2 3.3 3.4 3.2 3.3 3.4 3.2 3.3 3.4 3.2 3.2 3.1 3.4 3.2 3.2 3.1 3.4 3.2 3.2 3.1 3.4 3.2 3.1 3.4 3.2 3.1 3.4 3.2 3.1 3.4 3.2 3.1 3.4 3.2 3.1 3.4 3.2 3.1 3.4 3.2 3.2 3.1 3.4 3.2 3.1 3.4 3.2 3.2 3.1 3.2 3.2 3.1 3.4 3.2 3.2 3.1 3.4 3.2 3.2 3.2 3.1 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 12 17 17 19 22 19 16 22 19 12 17 17 19 22 19 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 19 22 23 21 19 22 23 21 19 19 22 23 21 19 19 22 23 21 19 19 22 23 20 19 19 22 23 20 19 19 22 23 20 19 19 22 23 20 19 18 19 24 23 20 17 19 19 24 23 20 17 19 18 19 24 23 20 17 19 18 19 24 24 23 20 17 19 24 24 19 24 23 20 17 19 22 24 19 23 24 19 24 23 20 17 19 22 24 19 23 24 19 23 24 19 23 24 19 23 24 19 23 24 19 23 24 19 23 24 19 23 24 19 21 24 19 23 24 19 21 24 19 21 24 19 21 24 19 21 24 21 21 22 21 21 22 21 22 21 21 | VEL (μm) 632 644 647 603 537 638 473 517 520 539 617 636 623 573 585 546 531 533 683 576 598 538 570 480 536 553 469 546 511 490 524 490 | FL (μm) 750 749 722 761 622 676 614 648 678 722 751 622 676 614 648 678 722 735 647 680 688 722 667 713 715 631 607 626 645 671 634 676 671 634 676 677 634 676 677 634 676 677 634 676 677 634 676 679 544 652 | FW (μm) 18 18 19 18 20 19 21 19 17 18 19 17 17 18 19 17 17 17 18 17 17 17 17 18 17 17 18 19 17 17 18 19 17 18 19 18 20 19 21 19 19 17 18 19 17 18 19 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 17 18 19 17 17 18 19 17 17 18 19 17 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 17 17 18 17 17 18 17 17 18 17 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 15 17 18 19 17 17 18 17 19 18 20 18 16 16 18 16 16 18 16 16 18 16 16 18 16 16 18 16 16 18 16 16 18 16 16 18 16 16 18 16 16 16 18 16 16 16 16 18 16 16 16 16 16 16 16 16 16 16 | FWT (µm) 3.9 3.8 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.4 2.8 3.6 3.5 3.5 3.4 3.7 4.2 4.0 3.4 3.7 4.2 4.0 3.4 3.7 4.3 3.6 3.5 3.2 3.0 3.4 3.5 3.5 3.5 3.2 3.0 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | LL (μm) 862 855 928 963 910 911 851 858 842 885 919 918 837 868 862 885 919 918 837 868 862 892 785 887 870 895 827 850 730 730 735 830 791 795 830 791 795 804 731 755 | LW (μm) 20 19 19 21 20 20 20 20 20 20 20 20 20 21 7 21 19 18 17 18 17 18 17 21 20 18 20 15 16 18 20 22 20 15 16 18 18 20 22 18 20 19 | LWT (µm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.4 4.2 3.7 3.9 4.2 4.2 3.5 3.6 3.3 4.3 3.5 3.6 3.9 4.2 4.2 4.2 5 5 3.6 3.3 4.3 4.3 3.5 3.6 3.9 4.7 4.2 4.2 4.2 5 5 3.6 3.3 4.3 4.3 3.5 5 3.6 3.3 4.3 4.3 3.5 5 3.6 3.3 4.3 4.3 4.3 3.5 5 3.6 3.3 4.3 4.3 3.5 5 3.6 3.3 4.3 4.3 3.5 5 3.6 3.3 4.3 3.5 5 3.6 3.3 4.3 3.5 5 3.6 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 3.5 5 3.6 3.9 4.7 4.2 4.2 4.2 3.5 3.6 3.3 4.3 3.5 5 3.6 3.9 4.7 4.2 4.2 3.5 3.6 3.3 4.3 3.5 5 3.6 3.7 3.9 4.7 4.2 3.7 3.9 4.0 3.5 3.6 3.3 4.3 3.5 5 3.6 3.7 3.7 3.9 4.2 4.2 3.7 3.9 4.2 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.7 3.9 4.2 3.7 3.7 3.9 4.2 3.7 3.7 3.9 3.6 3.7 3.7 3.9 3.7 3.7 3.9 3.7 3.7 3.7 3.9 3.6 3.7 3.7 3.9 3.6 3.7 3.7 3.9 3.6 3.7 3.7 3.9 3.6 3.7 3.7 3.9 3.6 3.7 3.7 3.0 3.5 3.6 3.7 3.7 3.9 3.6 3.7 3.7 3.0 3.9 3.6 3.7 3.7 3.0 3.5 3.6 3.7 3.7 3.0 3.9 3.6 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | SP % 66 73 85 83 74 62 79 74 75 81 83 65 67 68 62 73 67 75 67 68 64 82 71 58 70 67 72 64 59 62 | UR % 47 71 73 78 63 64 59 67 88 73 77 59 79 73 69 69 88 83 74 52 72 81 66 88 83 74 52 72 81 66 88 67 71 67 53 59 68 71 71 | TL (μm) 563 426 519 542 501 637 424 485 461 541 543 576 508 527 508 527 508 527 509 531 494 582 505 555 508 510 449 458 510 449 478 563 514 465 524 481 458 442 | TW (μm) 26 24 27 23 26 24 28 24 28 24 23 25 24 21 24 23 21 27 24 23 21 27 24 23 22 23 23 23 23 23 23 25 28 24 22 22 22 22 22 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.7 2.9 3.1 3.4 3.6 3.2 4.1 2.8 2.9 3.1 2.8 2.9 3.1 2.8 3.2 3.1 2.8 3.7 3.7 3.1 2.9 3.1 2.8 3.1 2.9 3.1 3.1 3.1 2.9 3.1 3.1 2.9 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 |
| Urmm 19 15 20 19 23 21 17 17 19 22 19 23 21 17 19 22 19 23 21 17 19 22 19 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 23 21 17 17 19 22 20 19 23 21 17 17 19 22 20 19 23 21 17 17 19 22 20 19 23 21 19 22 20 19 22 20 19 23 21 17 19 22 20 19 23 20 19 23 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 22 20 19 23 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 18 19 22 23 20 17 18 19 22 23 20 17 18 18 19 22 23 20 17 18 18 19 22 23 17 18 18 19 21 23 20 17 18 18 19 21 22 23 17 18 18 13 19 21 22 23 17 18 18 13 19 21 21 23 21 21 21 21 21 21 21 21 21 21 | VEL (µm) 632 644 647 603 537 638 473 517 520 539 617 636 623 573 585 546 531 533 683 576 598 536 537 546 531 533 683 577 538 576 598 536 577 546 537 546 531 533 683 577 538 576 598 536 577 538 577 539 617 636 623 577 546 531 537 546 537 546 531 537 546 537 546 531 533 546 531 533 546 536 558 576 598 536 536 536 537 539 546 531 533 546 536 558 577 538 576 538 577 538 577 538 576 538 577 538 577 538 576 538 577 538 577 538 576 538 577 538 577 538 577 538 576 538 577 538 577 538 576 538 577 538 577 538 576 538 577 538 576 538 576 536 536 536 536 536 536 536 53 | FL (μm) 750 749 722 761 762 676 614 648 678 722 761 622 676 614 648 678 722 735 647 680 688 722 667 713 715 735 675 691 607 626 645 671 634 676 679 544 652 553 | FW (μm) 18 18 19 18 20 19 21 19 21 19 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 17 18 19 17 17 18 19 17 17 17 18 19 17 17 18 19 17 17 17 18 19 17 17 18 19 17 17 18 19 17 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 18 17 18 17 18 17 18 17 18 17 18 17 18 10 17 18 17 18 17 18 10 17 18 17 18 17 18 10 18 10 17 18 10 17 18 10 17 18 10 17 18 20 18 18 20 18 18 18 18 20 18 18 18 18 18 18 18 18 18 18 | FWT (µm) 3.9 3.8 3.8 3.8 3.8 3.8 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 3.5 3.4 3.5 3.5 3.4 3.5 3.5 3.4 3.7 4.2 4.0 3.4 3.7 4.2 4.0 3.4 3.7 4.3 3.6 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | LL (μm) 862 855 928 963 910 911 851 858 832 842 842 842 842 842 842 842 842 842 84 | LW (μm) 20 19 19 21 20 20 20 20 20 17 21 19 18 17 21 20 18 17 21 20 18 17 21 20 20 20 17 21 5 16 18 18 20 22 18 16 18 18 18 16 18 18 20 22 21 20 20 20 20 20 20 20 20 20 20 20 20 20 | LWT (µm) 4.3 857 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.3 4.3 4.3 4.3 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.4 4.2 3.7 3.9 4.4 4.2 3.7 3.9 4.2 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.2 3.5 3.6 3.3 4.2 3.5 3.6 3.5 3.5 3.6 3.5 3.6 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.7 3.9 4.0 2.8 3.5 3.6 3.7 3.9 4.0 2.8 3.5 3.6 3.7 3.9 4.0 2.8 3.5 3.6 3.7 3.9 4.0 4.2 3.7 3.9 4.0 4.3 4.3 3.5 3.6 3.7 3.9 4.0 4.2 3.7 3.9 4.0 4.2 3.5 3.6 3.3 4.3 4.3 3.5 3.6 3.7 3.9 4.0 4.2 3.7 3.9 4.0 3.5 3.6 3.7 3.9 4.0 3.5 3.6 3.7 3.7 3.9 4.0 3.5 3.6 3.7 3.9 4.0 4.2 3.7 3.9 4.0 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 4.2 3.7 3.9 3.6 3.7 3.9 3.6 3.7 3.0 3.0 3.7 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 | SP % 666 73 85 83 74 62 79 74 75 81 83 65 65 65 65 88 82 73 67 65 88 82 73 67 67 68 64 82 71 77 58 64 82 71 77 58 62 77 59 62 72 64 59 59 | UR % 47 71 73 63 64 59 67 88 73 77 59 79 73 69 69 88 83 74 52 72 81 69 69 88 83 74 52 72 81 66 88 83 74 52 72 81 66 88 67 71 52 72 81 66 88 73 74 73 73 75 73 75 79 79 73 69 69 88 73 75 79 79 73 69 69 88 87 74 75 75 79 79 73 73 75 79 79 73 73 76 69 69 88 73 75 79 79 73 73 76 69 69 69 79 73 73 75 79 73 75 79 73 75 79 73 75 79 73 73 75 79 73 73 75 79 79 73 73 75 79 73 73 75 79 73 73 75 79 73 73 75 79 73 73 75 79 73 73 75 79 73 73 75 79 73 73 75 79 73 73 75 79 73 73 73 75 79 73 73 75 79 73 69 69 88 87 73 74 75 9 79 73 69 69 88 73 74 75 75 79 73 69 69 88 74 75 75 75 75 75 75 75 75 75 75 75 75 75 | TL (μm) 563 426 519 542 501 637 424 485 461 541 541 543 576 557 508 527 508 527 509 531 494 582 505 555 508 510 449 478 563 514 465 524 481 465 524 481 458 442 384 | TW (μm) 26 24 27 23 26 24 28 24 26 21 24 26 21 24 25 24 21 24 25 24 21 27 24 26 23 21 27 24 23 23 23 23 23 23 23 23 25 28 24 22 22 21 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.4 2.5 3.3 3.7 2.9 3.1 3.4 3.6 3.2 4.1 2.8 2.8 2.9 3.1 3.4 3.6 3.2 3.7 2.9 3.1 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 |
| Urmm 19 15 20 19 23 21 17 19 22 23 21 17 19 22 19 23 21 17 19 22 19 23 21 17 19 22 20 19 23 21 17 19 22 20 19 23 21 17 19 22 20 19 23 21 17 19 22 20 19 23 21 17 19 22 20 19 23 21 17 19 22 20 19 23 21 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 20 17 19 22 22 20 17 19 22 22 23 17 19 22 23 17 18 18 19 22 23 17 18 18 19 22 23 17 18 18 19 22 23 17 18 18 19 21 22 23 17 18 18 13 19 21 22 23 17 22 23 17 22 23 17 22 23 17 22 23 17 22 23 17 22 23 17 22 23 17 22 22 22 22 22 22 22 22 22 2 | VEL (μm) 632 644 647 603 5337 638 473 517 520 539 617 636 623 573 585 546 536 538 576 598 536 536 536 536 536 538 570 538 536 536 538 553 546 511 490 524 410 472 | FL (μm) 750 749 722 761 762 614 648 678 722 761 622 676 614 648 678 722 735 647 680 688 722 713 715 735 675 691 607 626 645 671 634 676 679 544 652 553 593 | FW (μm) 18 18 19 18 20 19 21 19 21 19 17 18 19 17 17 18 19 17 17 17 18 19 17 17 17 18 19 17 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 19 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 17 17 18 20 17 17 17 18 20 17 17 17 18 20 17 17 17 17 17 17 17 17 17 17 | FWT (µm) 3.9 3.8 3.8 4.2 3.4 3.6 3.5 3.1 3.1 3.4 2.8 3.6 3.5 3.4 3.5 3.5 3.4 3.5 3.5 3.4 3.5 3.5 3.4 3.6 3.5 3.5 3.4 3.6 3.5 3.5 3.4 3.6 3.5 3.5 3.4 3.6 3.5 3.5 3.1 3.1 3.4 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | LL (μm) 862 855 928 963 910 911 851 858 832 842 842 845 919 918 837 868 862 887 855 887 855 887 855 827 850 730 755 830 791 795 804 731 750 650 721 | LW (μm) 20 19 19 20 20 20 20 20 20 20 17 21 19 18 17 21 20 18 17 21 20 18 20 19 22 20 15 16 18 18 20 22 18 19 22 20 19 19 19 22 20 20 20 20 20 20 20 20 20 20 20 20 | LWT (µm) 4.3 857 4.2 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.3 4.3 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 4.2 4.2 4.2 3.7 3.9 4.4 4.2 3.7 3.9 4.2 3.5 3.6 3.9 4.2 4.2 3.7 3.9 4.0 2.8 3.5 3.6 3.3 4.3 4.2 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.5 3.6 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.6 3.7 4.2 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.2 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.9 4.7 4.2 3.7 3.9 4.2 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.6 3.5 3.5 3.6 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.7 3.9 4.2 3.7 3.9 3.6 3.7 3.9 3.6 3.7 3.9 3.6 3.7 3.9 3.6 3.5 3.0 3.5 3.6 3.0 3.5 3.6 3.0 3.9 3.5 3.6 3.0 3.9 3.6 3.5 3.6 3.0 3.9 3.6 3.5 3.6 3.0 3.9 3.6 3.5 3.6 3.5 3.6 3.7 3.9 3.6 3.5 3.6 3.5 3.6 3.9 3.5 3.6 3.9 3.5 3.6 3.0 3.9 3.6 3.5 3.5 3.6 3.5 3.5 3.6 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.5 | SP % 666 73 85 83 74 62 79 74 75 81 83 65 67 69 58 82 73 67 75 67 68 82 73 67 75 67 68 82 73 67 75 67 67 75 67 67 75 81 72 64 82 71 75 82 73 73 75 75 79 74 75 79 74 75 81 82 73 75 75 82 73 75 75 82 73 75 75 82 73 75 75 82 73 75 82 73 75 82 75 75 75 82 75 82 75 82 75 82 75 82 75 82 75 82 75 82 75 75 82 75 82 75 82 75 82 75 82 75 82 75 83 82 75 82 75 82 75 85 82 75 85 82 75 88 82 75 75 88 82 75 75 88 82 75 75 88 82 75 75 87 87 75 87 87 75 87 75 87 75 87 75 87 75 87 75 87 75 87 75 87 75 87 75 87 75 75 75 87 75 75 75 75 75 75 75 75 75 75 75 75 75 | UR % 47 71 73 63 64 59 67 88 73 77 59 79 73 69 69 88 83 74 52 72 81 69 88 83 74 52 72 81 66 88 83 74 52 72 81 66 88 67 71 59 69 88 83 74 52 72 81 66 88 67 71 59 69 88 83 74 59 69 69 88 83 74 59 69 69 88 83 74 75 75 69 69 88 83 74 75 75 79 79 79 73 69 69 88 83 74 75 79 79 73 69 69 88 83 74 75 79 79 73 69 69 88 83 74 75 79 79 73 69 69 88 83 74 75 79 79 73 69 69 88 83 74 59 79 73 69 69 88 83 74 59 79 79 73 69 69 88 83 74 59 79 79 73 69 69 88 83 74 52 72 81 69 88 83 74 52 72 81 69 88 83 74 52 72 81 69 88 83 74 52 75 87 75 75 75 75 79 73 69 69 88 88 74 52 72 81 69 88 83 74 52 72 81 88 83 74 52 75 75 88 83 74 52 75 88 88 83 74 52 75 88 88 83 74 52 75 75 75 75 75 75 75 75 75 75 75 75 75 | TL (μm) 563 426 519 542 501 637 424 485 461 541 541 541 543 576 557 508 527 509 531 494 582 509 531 494 582 505 555 508 510 449 478 563 514 465 524 481 458 442 384 425 | TW (μm) 26 24 27 23 26 24 28 24 26 21 24 23 25 24 21 24 26 23 21 24 23 21 27 24 24 23 23 23 23 23 23 23 23 23 23 23 23 23 | TWT (μm) 3.7 3.2 3.2 3.3 3.1 2.8 3.5 2.8 3.1 2.9 2.8 3.0 3.3 3.4 2.5 3.3 3.7 2.9 3.1 3.4 3.6 3.2 4.1 2.8 2.8 2.8 2.8 2.9 3.1 2.8 3.7 3.7 2.9 3.1 2.9 3.1 2.9 3.1 2.9 3.1 2.9 3.1 2.9 3.1 2.9 3.1 2.9 3.1 3.1 2.9 3.1 3.1 2.9 3.1 3.1 2.9 3.1 3.1 2.9 3.1 3.1 2.9 3.1 3.1 2.9 3.1 3.1 2.9 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 |

Table 4. Non-anatomical data and wood anatomical characters of *Rhododendron* ponticum.

| | | | | F | Partial Regress | ion Coefficier | nt | Standard Reg. Coefficient | | | | |
|------------|------|-------------|----------------|---------------|-----------------|----------------|-------|---------------------------|-------|-------|-------|--|
| Character | CD | F-ra | tio Cons. | ALT | SD | SA | WAR | ALT | SD | SA | WAR | |
| R. ponticu | ım | | | | | | | | | | | |
| TD | 0.50 | 13.6 *** | 25.7 *** | -0.002 ** | 0.412 | 0.048 | 1.06 | -0.45 | 23 | 0.17 | 0.17 | |
| PPL | 0.22 | 3.9 ** | 67.4 *** | -0.005 * | 0.605 | 0.067 | -1.49 | -0.44 | 0.17 | 0.12 | -0.12 | |
| VEL | 0.30 | 5.6 *** | 601.3 *** | -0.067 *** | -4.46 | 2.43 * | -21.6 | -0.61 | -0.12 | 0.42 | -0.17 | |
| FL | 0.26 | 4.8 ** | 677.8 *** | -0.047 * | -1.68 | 2.45 * | 2.69 | -0.44 | -0.05 | 0.43 | 0.02 | |
| LL | 0.49 | 12.8 *** | 885.0 *** | -0.083 *** | -0.44 | 2.37 * | -10.7 | -0.73 | -0.01 | 0.39 | -0.08 | |
| R. caucasi | cum | | | | | | | | | | | |
| TD | 0.92 | 73.5 *** | 28.5 *** | -0.005 *** | 1.20 | 0.087 * | 1.02 | -0.66 | 0.21 | 0.22 | 0.05 | |
| PPL | 0.60 | 9.2 | 65.2 | -0.0109 | -6.19 | 0.405 | 22.0 | -0.63 | -0.46 | 0.44 | 0.40 | |
| | 0.22 | ~*** | *** | * | 0 47 | 0.021 | 0.00 | 0.60 | 0.46 | 0.45 | 0.00 | |
| MRW | 0.52 | 5.0 * | D.ک *** | -0.0009 | -0.47 | 0.051 | -0.00 | -0.69 | -0.40 | 0.45 | 0.00 | |
| PD | 0.53 | 7.1 | 1022 | 0.0066 | -26.5 | -3.641 | 591 | 0.02 | -0.11 | -0.21 | -0.59 | |
| - | 0.07 | *** | *** | 0.050 | 00.40 | 4 600 | * | 0.00 | 0.47 | 0.40 | 0.00 | |
| FL | 0.67 | 12.9 | 464.8 | -0.059 | 22.10 | 1.682 | 155 | -0.36 | 0.17 | 0.19 | 0.30 | |
| | 0.00 | *** | *** | * | 0.00 | 0.000 | 0.40 | 0.04 | 0.07 | 0.00 | 0.07 | |
| FWI | 0.62 | 10.0 | 3.4 | -0.0004 | 0.39 | 0.003 | -0.18 | -0.34 | 0.37 | 0.06 | -0.05 | |
| TI | 0.46 | *** | *** 1 4 G E | * | 20 F | 1 207 | CE | 0.14 | 0.25 | 0.10 | 0.61 | |
| IL | 0.40 | 5.0 * | 140.D *** | 0.022 | 20.5 | 1.007 | 200 | 0.14 | 0.25 | 0.18 | 0.01 | |

Table 5. Multiple Regression Analysis of Significant Wood Anatomical Characters of *R. ponticum* and *caucasicum*.

*: Significant at 5 % level, **: significant at 1 % level, and ***: significant at 0.1 % level.

Legends for Table 1, 2, 3, 4, 5.

ALT: altitude, SD: stem diameter, SA: stem age, WAR: width of annual rings, TD: tangential pore diameter, BAR: bar number per perforation plates, PPL: perforation plates length, MRH: multiseriate ray height, MRW1: multiseriate ray width (cell), MRW2: multiseriate ray width (micron), PD: pore density, MRD: multiseriate rays density, MRmm: multiseriate rays in mm, URmm: uniseriate rays in mm, VEL: vessel elements length, FL: fibre-tracheids length, FW: fibre-tracheids width, FWT: wall thickness of fibre-tracheids, LL: libriform fibre length, LW: libriform fibre width, LWT: wall thickness of libriform fibre, SP: percentage of solitary pore, UR: percentage of uniseriate rays, TL: tracheids length, TW: tracheids width, TWT: wall thickness of tracheids (Due to no variation with altitude, the table for *R. luteum* is not given).

campanulatum D. Don, *R. lepidotum* Wall., *R. arboreum* Smith. (8), on *Alnus nepalensis* D. Don (7) in East Nepal, and on *Syringa oblata* Lindl. var. *giraldii* (9) in Northwestern China. The intraspecific ecological trend in the anatomy of Turkish *Rhododendron* species conform to those in the four Nepalese *Rhododendron* and *A. nepalensis*. In those studies, there is a strong negative correlation between altitude and ring width, stem diameter, vessel member, fibre length, pore diameter, and ray dimensions. At the same time vessel density has a positive correlation with altitude in contrast to the former features. However, the results of *Syringa oblata* var. *giraldii* run counter to the altitudinal trend in wood structure reported for four Nepalese *Rhododendron*, *A. nepalensis* and Turkish *Rhododendron* species. While most of the quantitative wood anatomical characters decreased with altitude in the temperate regions, they increased with altitude in the rainfall regions (in *Syringa oblata* var. *giraldii*). In the rainfall region, average ring width, vessel frequency, percentages of solitary vessels,

vessel member length, vessel diameter, fibre length and diameter, ray height and frequency (per square tangential mm) increase with altitude. There is a strong positive correlation between altitude and ring width, percentage of solitary vessels, vessel member length, fibre length and ray dimensions; at the same time vessel frequency and ray frequency are inversely related to altitude (9).

The wood structure does not vary directly according to habit, but to the ecological factors related to altitude. Although the shrubby species are most abundant at high altitude, there are several shrubby species at low altitude, for example R. luteum, which is a deciduous shrub growing on both low and high altitudes from 110 to 2200 m. Stem diameter does not vary with altitude. Therefore, its wood anatomical characters are not influenced by non-anatomical factors, especially with altitude. In Pittosporum ferrugineum Ait. f., Van der Graaff and Baas (13) noticed that there was no correlation between altitude and the wood anatomical characters analyzed and that the variation was guite small for altitude, between sea level and 2667 m. Climatic factors, such as temperature and water supply play an important role in the xylem element size.

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Baas (14) stresses that, in both the northern and southern hemispheres and the Old and New Worlds, temperate and subtropical species are characterized with narrow vessels, relatively short vessel members and few bars, and conspicuous spiral thickenings on both vessel and fibre walls. In tropical lowland species, growth rings are absent or less marked, and the vessels are scanty and wide. The vessel members are long and the number of bars is high, spirals are lacking, and the fibre-tracheids usually have few pits. Tropical montane species resemble the temperate ones.

Seeing that the role of wood is conducting water and mechanical support, wood anatomy will differ with ecological conditions and plant habit.

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