|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Esteban et al. (2004) | Features / Fossil species | *Cedroxylon shakhtnaense*comb. nov. | 7. *Abies* sect. *Balsamea* Engelm. emend. Farjon \_ Type: *Abies**balsamea* (L.) Mill. (microscopic observation) | *A. fraseri*(Pursh) Poir. | *A. koreana*E. H. Wilson | *A. lasiocarpa* (Hook.)Nutt. (microscopic observation) | *A.**nephrolepis*(Trautv.) Maxim. | *A.**sachalinensis*Mast. | *A. sibirica* Ledeb. (microscopic observation) | *A. veitchii*Lindl. (microscopic observation) |
| AT1 | Well‐defined growthrings | + | + | + | + | + | + | + | + | + |
| AT3 | Axial tracheids ofcircular section | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | + |
| AT4 | Axial tracheids ofpolygonal section | + | + | + | + | + | + | + | + | + |
| AT6 | Intercellular spacespresent | + | ‐ | ‐ | + | ‐ | ‐ | ‐ | ‐ | ‐ |
| AT8 | Spiral thickenings present,but not in all the axial tracheids | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ |
| AT9 | Bordered pits present on the tangential wallsof the axial tracheids | + | + | + | + | + | + | + | + | + |
| AT10 | Uniseriate bordered pits on the radial wallsof the axial tracheids | + | + | + | + | + | + | + | + | + |
| AT11 | Biseriate bordered pits on the radial wallsof the axial tracheids | (occasionally) | + | ‐ | ‐ | ‐ | ‐ | + | ‐ | ‐ |
| AT14 | Bordered pits with included elliptic aperture | ‐ | ‐ | ‐ | ‐ | ‐ | + | ‐ | ‐ | ‐ |
| AT16 | Pits present borders withradial striation | ‐ | ‐ | ‐ | ‐ | ‐ | + | + | ‐ | ‐ |
| AT19 | Bars of Sanio | + | ‐ | ‐ | ‐ | ‐ | ‐ | + | ‐ | ‐ |
| AT20 | Trabecula | ‐ | ‐ | ‐ | ‐ | + | ‐ | ‐ | ‐ | ‐ |
| AT21 | Crystals present in axialtracheids | ‐ | + | ‐ | ‐ | ‐ | + | ‐ | ‐ | + |
| P1 | Axial parenchymaabsent or scarce | + | + | ‐ | ‐ | + | + | + | + | + |
| P2 | Axial parenchyma with smooth transverse walls | + | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | + |
| P3 | Axial parenchyma with nodular transverse walls | + | + | + | + | ‐ | ‐ | ‐ | + | + |
| P4 | Axial parenchyma with crystals | ‐ | + | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | + |
| P5 | Axial parenchymawith resin | ? | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | + | ‐ |
| P6 | Diffuse axial parenchymapresent | + | + | + | + | ‐ | ‐ | ‐ | + | + |
| P8 | Terminal axialparenchyma present | + / ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ |
| R1 | Uniseriate rays | + | + | + | + | + | + | + | + | + |
| R2 | Partially biseriate rays | (in less than 10% of the total number of the rays) | + | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ |
| R4 | Ray height from 1 to15 cells | + | + | + | + | + | + | + | + | + |
| R5 | Ray height from 16 to 30cells | + | ‐ | ‐ | ‐ | + | ‐ | ‐ | ‐ | ‐ |
| R7 | Number of rays permm2 <70 | + | + | + | ‐ | + | ‐ | + | ‐ | ‐ |
| R8 | Number of rays per mm2 between 70‐100 | ‐ | ‐ | + | + | ‐ | ‐ | ‐ | + | ‐ |
| R9 | Number of rays permm2 >70 | ‐ | ‐ | ‐ | ‐ | ‐ | + | ‐ | + | + |
| R17 | Ray parenchyma withnodular axial walls | + | + | + | + | + | + | + | + | + |
| R19 | Ray parenchyma with pitted horizontal walls | + | + | + | + | + | + | + | + | + |
| R20 | Ray parenchyma withcrystals | ‐ | + | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ |
| R23 | Piceoid cross field pits | + | + | + | + | + | + | + | + | + |
| R24 | Cupressoid cross fieldpits | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ |
| R25 | Taxodioid cross fieldpits | + | ‐ | ‐ | ‐ | + | ‐ | ‐ | ‐ | ‐ |
| R26 | 1 to 2 pits per cross field | + | + | + | + | + | + | + | + | + |
| R27 | 3 to 4 pits per crossfield | + | ‐ | ‐ | ‐ | ‐ | ‐ | + | ‐ | ‐ |
| RC1 | Resin canals absent | + | + | + | + | + | + | + | + | + |
| RC3 | Thick‐walled epithelial cell resin canals | + | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ |
| RC4 | Number of epithelial cells inthe axial resin canals <9 | + | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ |
| RC5 | Number of epithelial cells in the axial resin canals > 9 | + | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ | ‐ |