

## Red Microscopy: Polarization Imaging with 1mW Laser 650 nm

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The term red microscopy refers to monochromatic polarization imaging, in red and black, of birefringent specimens prepared as ground thin-sections that are widefield illuminated by a linearly or circularly polarized laser 650nm. For this purpose, a finite-optical upright microscope, 160mm mechanical tube length, was used, which was equipped with: (i) two interchangeable afocal (no Koehler) illumination sources, one a LCD light and the other a 1 mW laser 650 nm (laser class 2); (ii) polarization devices (polarizer, retardation wave plates, analyzer); (iii) planapo objectives (4x, 10x, 20x,40x,60x); (iv) a digital imaging system using a CCD camera for recording purposes. Regions of interest in the section were first viewed, focused, and photographed with the CCD camera using polarized light microscopy. Once done the light source was exchanged to laser one and the same field image was viewed on the screen and recorded adjusting the exposure time. With this laser system a number of anisotropic materials that exhibit intrinsic or form birefringence were imaged, particularly mineralized tissues (figure). The formation of the polarized laser image is also governed by the optical path difference (the relative retardation,  $T = Bt$ ) and the optical performance of the objective.

