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Reflectance and transmittance spectra of leaves and shoots of 22 vascular plant species and reflectance spectra of trunks and branches of 12 tree species in Japan

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Abstract This data paper reports spectral reflectance and transmittance data of leaves from 21 terrestrial vascular plant species (seven herbaceous, and 14 broadleaf and long-needle coniferous tree species) and of shoots from one short-needle coniferous tree species. The reflectance spectra of branches of one tree species, of the trunks of 12 tree species and ground surface of one deciduous broad-leaf forest are also reported. Optical measurements and leaf samplings were made at five sites on Honshu Island, Japan, which are typical vegetation types in East Asia, i.e., grassland, paddy field, and deciduous broad-leaf or coniferous forests. The collection and measurements were conducted for main species in each site. To include other common vegetation types

in East Asia, such as evergreen broad-leaf or coniferous forests, the sample collection and the measurements were conducted at gardens and an experimental forest. Leaves of ten deciduous species were measured at different phenological stages from leaf expansion to senescence since those species shows significant seasonal changes in spectral reflectance and transmittance of leaves. Leaves at different position in a canopy (e.g., sunlit versus shaded leaves) were also measured for eight of 21 species. The spectral reflectance and transmittance from both adaxial and abaxial sides of the all leaves or needles, except *Picea abies* needles. The measurements of the leaves were conducted with a spectroradiometer attached via an optical fiber to an integrating sphere. Two types of integrating spheres were used: a model LI-1800-12 (Li-Cor) and an RTS-3ZC integrating sphere (Analytical Spectral Devices). A leaf clip accessory was also used instead of an integrating sphere for measuring the leaves of two species. All data were measured within the 350–2,500-nm spectral range with 1-nm steps between measurements but the data obtained by LI-1800 is unavailable in 1,650–1,740, 1,890–1,950, and 2,050–2,500 nm because of a large amount of noise. These data are used as input parameters in a radiative transfer model designed to estimate the leaf area index from radiation reflected from a canopy surface.

The complete data set for this abstract published in the Data Paper section of the journal is available in electronic format in Ecological Research Data Paper Archives at http://db.cger.nies.go.jp/JaLTER/ER_DataPapers/archives/2013/ERDP-2013-02.

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