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IDENTIFICATION OF THE MAIN DYESTUFFS PRESENT IN BARKS OF ALDERS, BIRCH, OAK AND ASPEN

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Substantial amounts of bark of forest trees are a by-product of wood processing, a major proportion of which is used for energy production. Nevertheless, it could also be a valuable source of tannins for use as natural colourants [1]. The barks of many trees are suitable sources of reddish-brown dyes. The most frequently mentioned brown-colouring barks were tannin-rich alder, oak, hemlock and maple [2]. Hydroxyl groups of tannins have capability form effective bonds with protein fibres and dyes to provide fix dyes by nonspecific bonding. Commonly, plant tannins (catechins, proanthocyanidins and polyphenols) have a strong affinity for proteins. Tannins together with metallic salt mordants form metal tannates, resulting in better colour fastness [2,3].

The popular dye trees of Latvia summarized in the listing of plant dyes are: black alder (*Alnus glutinosa*), grey alder (*Alnus incana*), silver birch (*Betula pendula*), juniper (*Juniperus communis*), alder buckthorn (*Frangula alnus*), pedunculate oak (*Quercus robur*), bird cherry (*Padus avium*), aspen (*Populus tremula*), European crab apple (*Malus sylvestris*), ash (*Fraxinus excelsior*) [4, 5]. Dyeing process and materials used in farmsteads differed from the ones practiced by professional dyers. The peasants were employed birch bark in dyeing, mainly in light browns, blacks or other drab colours. The professional dyers obtained brighter tones and fastness of colours. Oaks were used by 18th- and 19th-century professional dyers, for they contained tannins and other dyeing agents which would give woollens stable colours [2].

The objective of the present study was to evaluate the extracts of black alder, grey alder, pedunculate oak, silver birch and aspen as natural textile dye. The dyeing solutions of barks were analysed by UPLC-DAD-MS. The preliminary results show that barks are a valuable source of tannins for use as natural colourants. Hydrolysable tannins (gallic acid, ellagic acid) and condensed tannins (catechin, procyanidins) were found in water extracts from tree barks.

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