The Chemistry of Brazilian Lauraceae. XLVII. Ferulic esters from Endlicheria and Ocotea species

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A specimen from the Torquato-Tapajós Highway, km 133, Amazonas, voucher Herbarium INPA 48255, was identified tentatively with Endlicheria anomala Nees (Lauraceae) by Dr. W. A. Rodrigues. A trunk wood sample (1.2 kg) was extracted with ethanol. The chloroform-benzene 1:1 soluble part (15 g) of the extract (38 g) was chromatographed on a silica (360 g) column. Elution with C6H6 gave, in order, fatty ester (2 g, oil), n-tetracosyl ferulate [347 mg, mp 65-67° (C6H6)], n-tetracosanol [93 mg, 71-73° (C6H6)] and sitosterol [1230 mg, 138-140° (EtOH)]. Elution with C6H6 CHCl3 9:1, C6H6 CHCl3 8:2 to 0:10, CHCl3 AcOEt 9:1 and AcOEt MeOH 9:1 gave respectively stearic acid [70 mg, mp 68-69° (C6H6-EtOH)], a stearate of a fatty alcohol [58 mg, mp 86-88° (EtOH-CHCl3)], a ferulate of a fatty alcohol [90 mg, mp 77-78° (EtOH-CHCl3)] and a glycoside [28 mg, mp 291-293° (EtOH-CHCl3)].

n-Tetracosyl ferulate was identified by spectral data (IR, 'H NMR, MS) and direct comparison with authentic samples. Saponification of the additional esters, mp 86-88° and 77-78°, gave respectively stearic acid, mp 69-70°, and ferulic acid, 169-170°.

The simplicity of composition of E. anomala contrasts with the diversity and complexity of cinnamate derived metabolites of Lauraceae species described in all previous reports of the present series [for part XLVI see Diaz et al., 1977]. In this respect, the species, nevertheless, does not occupy a peculiar position. Absence of detectable quantities of cinnamate derived metabolites and accumulation of ferulic acid was noted additionally for the following species.

Ocotea canaliculata Mez from the Manaus-Itacoatiara Highway, km 140, Amazonas, cf. voucher Herbarium INPA 16896, identified by Dr. W. A. Rodrigues.

O. guianensis Aubl. from the Manaus-Ponta Negra Road, Amazonas, voucher Herbarium INPA 50121, identified by B. Albuquerque.

O. neesiana (Miq.) Kosterm. from the Manaus-Itacoara Highway, km 69, voucher Herbarium INPA, Manaus 47243, identified by Dr. W. A. Rodrigues.

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O. opifera Mart. from the vicinity of Manaus, Amazonas, cf. voucher Herbarium INPA 9210, identified by M. Freitas.

O. sp. from the Ducke Forest Reserve, near Manaus, voucher Herbarium INPA 42208.

It must be concluded that all these species lack the enzymes necessary to channel cinnamates into more complex end products. The ferulic acid, which is thus accumulated, inhibits L-phenylalanine ammonia-lyase activity [Havir and Hanson, 1968] and, as a consequence, the formation of benzylisoquinoline alkaloids should be favoured. Indeed, the above mentioned unclassified Ocotea species contains two papaverine type alkaloids [Francá et al., 1975]. This mechanism may explain the fairly general substitutive presence of benzylisoquinolines vs. arylpropanoids in the Magnoliidae [Gottlieb, 1972], i.e. the phenomenon by which a species contains predominantly one of these classes of metabolites, producing, if at all, only traces of the other.

**Literature Cited**

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