

|| CHEMICAL ANALYSIS OF RAPANEA MELANPHLOES
(MYRSINACEAE) ALKYL BENZOQUINONES AND SOME OF THEIR
BIOLOGICAL ACTIVITIES. ||

BY

YACOB GHEBREMESKEL

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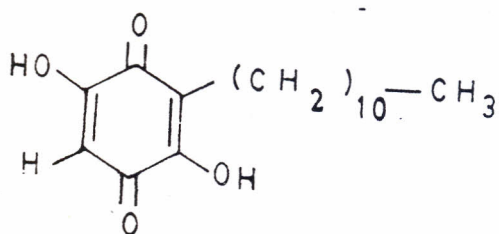
SUMMARY

Rapanea melanphloes is one of the members of Myrsinaceae found in Kenya. R. melanphloes finds use in ethnopharmacology as anthelmintic.

The fruits, leaves and stem bark of the plant were extracted with polar and non-polar solvents. This was followed by column chromatography using deactivated silica gel saturated with 3% oxalic acid and spectroscopic analysis using UV, IR, NMR (^1H & ^{13}C) and MS. The main compounds were found to be benzoquinone pigments with long aliphatic side chains. The level of benzoquinone concentration was higher in the fruits followed by stem bark; however, the leaves were detected to contain the least but still appreciable amounts of the compounds.

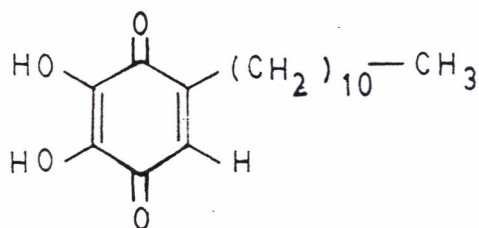
Embelin (1), myrsinone (65) and an unsaturated C-27 fatty acid (75) were isolated from all parts of the plant although the fatty acid was only in trace quantities in the bark.

The homologues of myrsinone, 70 (C-13) and 71 (C-15) were only isolated from the leaves whereas myrsinaquinone (72) and a bis-benzoquinone (76) were only available in the fruits of the plant. Except for embelin (1), all other benzoquinones represent novel structures.



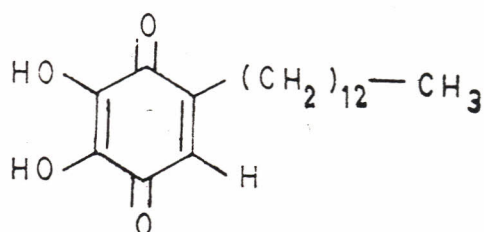
Embelin,

2,5 - dihydroxy - 3 - undecyl - p -benzoquinone



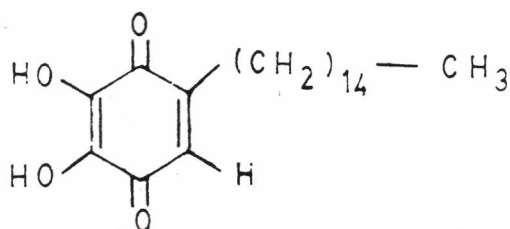
Myrsinone,

2,3 - dihydroxy - 5 - undecyl - p - benzoquinone



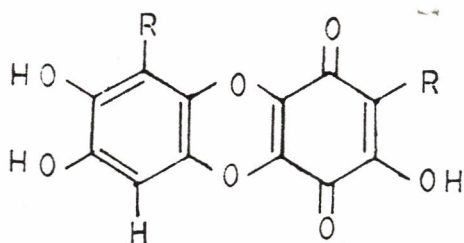
70
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2,3 - dihydroxy - 5 - tridecyl - p - benzoquinone



71
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2,3 - dihydroxy - 5 - pentadecyl - p - benzoquinone



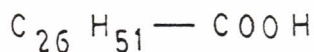
R: C₁₁ H₂₃

: C₁₃ H₂₇

72
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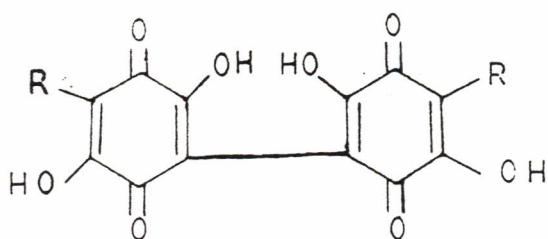
Myrsinaquinone,

2,9,10-trihydroxy-3,8-dialkyl-benzo-p-benzoquinonedioxane



75

Hexaeicosa - 22 - enoic acid

R: $C_{11}H_{23}$: $C_{13}H_{27}$, $C_{15}H_{31}$

76

2,2',5,5' -tetrahydroxy-3,3'-dialkyl-6,6'-bis-p-benzoquinone

Bioassays such as larvicidal, anti-feedant and anti-fertility tests were done on some of the compounds. Anti-fertility activities were carried out on white New Zealand sexually mature male rabbits. Embelin (1) and myrsinone (65) were injected separately. Testosterone and progesterone levels were measured in blood by radioimmunoassay and luteinizing hormone (LH) by mouse interstitial cell testosterone bioassay.

Reduction in testosterone levels were upto 90% after the seventh day of injection. Concentration of hormones reverted back to normal after ten days post-stopage.

Anti-feedant tests were done on mid 5th instar nymphs of Schistocerca gregaria (desert locusts) and a concentration of 100 ug/ml of each sample was used on Whatman No.1 filter paper. Compound 1 and 65 were found to have a relative anti-feedant percentage (RAP) of 88.4 and 90.2 respectively whereas compound 72 had an RAP of 44.5.

The larvicidal tests were carried out on mosquito larvae, Aedes aegypti and were analysed by frequency of probit. Compound 72 had an L_{D50} of 2.69ug/ml while 1 and 65 had an L_{D50} of 2.40 and 2.54ug/ml respectively.