

Potent poisonous compounds from *Elaeodendron croceum*

T. Yelani, A.A. Hussein, J.J.M. Meyer

Department of Plant Science, University of Pretoria, Pretoria 0002, South Africa

Several authors have reported that most parts of *Elaeodendron croceum* are poisonous. "Witchdoctors" apparently previously used the species to cause death and the bark has been reported to be fatal to humans, presumably due to the presence of alkaloids. The plant has also been suspected as the cause of human death in at least two court cases. A phytochemical investigation of the poisonous leaves of *E. croceum* guided by cytotoxicity against Vero cells, led to the isolation of five compounds; 20-hydroxy-20-*epi*-tingenone (1), tingenone (2), tingenine B (3), 11 α -hydroxy- β -amyryn (4), and naringenin (5). Compounds 1 and 2 showed extremely high toxicity against Vero cells (IC₅₀: 2.65 nM and 8.23 μ M respectively). Cytotoxicity of the isolated compounds against three human cancer cell lines, HeLa, MCF-7, and SNO was also determined. Compounds 1 and 2 again showed the highest cytotoxicity with IC₅₀ values ranging between 2.47–0.43 μ M. This is the first report on the isolation of these highly toxic compounds from *E. croceum* and in all probability explains why it is so poisonous.

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Non-destructive estimation of content using near-infrared spectroscopy to rapidly assess kraft pulp yield of *Eucalyptus grandis*

A. Zbonak, T. Bush

Forestry and Forest Products Research Centre, Council for Scientific and Industrial Research, PO Box 17001, Congella 4013, South Africa

Kraft pulp yield is important for plantation profitability, but traditional assessment is time consuming and costly. Cellulose content is one of the properties which strongly influences the kraft pulp yield. However the determination of cellulose still involves wet chemistry measurement which limits the number of samples that can be processed within a tree breeding program. In this paper, the utility of near infrared (NIR) spectroscopy for predicting cellulose contents in *E. grandis* was examined. *E. grandis* is one of the major species in South Africa grown for pulp and paper production. Wood samples were collected from 16 sites in different regions of SA to capture the widest possible variation in the investigated property. NIR spectra, collected from both sawdust and solid wood samples, were combined with their corresponding cellulose concentrations to develop NIR predictive models. The results of the NIR models including the different sampling strategies used are discussed. The developed models were used to predict the cellulose profiles on pith-to-bark strips sampled at breast-height from 28 trees. The weighted mean values for cellulose representing the whole disc were then related to the kraft pulp yield of the corresponding 2 m long billet samples. It was observed that cellulose was strongly correlated with screened pulp yield, highlighting that NIR spectroscopy can be a valuable tool in a tree breeding program for the rapid and non-destructive assessment of kraft pulp yield.

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A novel phenolic compound and an alternative biosynthetic pathway for flavonoids in *Helichrysum aureonitens*S.M. Ziaratnia^a, A.A. Hussein^b, O. Kiyoshi^c, T. Muranaka^c, K.J. Kuner^d, J.J.M. Meyer^d^a*Department of Plant Science, University of Pretoria, Pretoria 0002, South Africa*^b*Chemistry of Medicinal Plants Department, National Research Center, Cairo, Egypt*^c*Plant Science Centre, RIKEN Institute, Yokohama, Japan*^d*Forestry and Agricultural Biotechnology Institute, University of Pretoria, Pretoria 0002, South Africa*

A new chlorophenol, 1-hydroxy-5-chlorophenylhepta-1,3,5-triene (triyne), was isolated as the major phenolic compound from a *Helichrysum aureonitens* cell suspension culture. The methyl ether form of triyne has been previously isolated from *H. coriaceum*. The flavonoids, galangin and kaempferol, which are present in leaves of *H. aureonitens* was not detectable in the cell suspension extract. The results of GC/MS analyses on the leaves of *H. aureonitens* showed that the species contain 4' hydroxylated and non-hydroxylated flavonoids as well as their respective precursors, pinobanksin and naringenin. This finding has not been reported before and our investigation on the biosyntheses of these flavonoids resulted in the detection of a new variation on the C4H gene that is playing a key role in an alternative biosynthetic route for 4' hydroxylated flavonoids.

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Posters**Do *Isoglossa sensu lato* and relatives belong to their own subtribe *Isoglossinae* or are they just specialized *Justiciinae*?**K. Balkwil^a, D.L. Poriazi^a, G.V. Cron^a, C.M. Lalkhan^b^a*C.E. Moss Herbarium, Animal Plant and Environmental Sciences, University of the Witwatersrand, Private Bag 3, Wits 2050, Johannesburg, South Africa*^b*Electron Microscope Unit, University of the Witwatersrand, Private Bag 3, Wits 2050, Johannesburg, South Africa*

Isoglossa comprises 50 species in the Old World tropics, of which twelve are recorded in southern Africa. Various classifications of the *Acanthaceae* have led to contrasting positions of the genus *Isoglossa*. The superficially most similar genus to *Isoglossa* in southern Africa is *Justicia*. Notable differences include the gürtel pollen which characterises *Isoglossa* and relatives. This study seeks to determine whether *Isoglossa sensu lato* and relatives should be recognised at subtribal level. Further, we seek to determine whether or not a formerly recognized genus, *Ramusia*, should be resurrected and whether macro-morphological differences support the placement of *Isoglossa pawekiae* in a new genus. Thus, morphological relationships of Old World *Justiciinae* and *Isoglossinae* (*Acanthaceae*:*Justicieae*) were studied with a taxon sample including one species from each section (fidé Immelman) within the genus *Justicia* and eleven species from the two Old World *Isoglossinae* genera, *Brachystephanus* and *Isoglossa*. The *Isoglossa* species were selected to include those previously recognized as the genera *Strophacanthus* and *Ramusia*. *Rhinacanthus gracilis* var. *latilabiatus*, as well as a *Ptyssiglottis* species were also included. *Asystasia gangetica* was chosen as the outgroup. A morphological data matrix was compiled and run through PAUP 4.0b10 (Altive). The results support the recognition of the sub-tribe *Isoglossinae*, including *Isoglossa sensu lato* and relatives. On the basis of morphological characters, the resurrection of *Ramusia* is inconclusive, as is the placement of *Isoglossa pawekiae* and highlights the necessity for molecular research.

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An investigation of the rate of biogenic volatile organic carbon emission from commercial crops and plantation species in the Mpumalanga Province

V.K. Batrakova, M. Scholes

University of the Witwatersrand, Private Bag 3, Wits 2050, Johannesburg, South Africa

Biogenic volatile organic carbon (BVOC) emissions were measured for three crop and two plantation species (*Banana*, *Mango*, *Avocados*, *Pine* and *Eucalyptus*) grown in the Mpumalanga area. Screening procedures showed that all five species were emitters. No differences in isoprene and terpene concentrations were observed between crops and plantation species. All species showed a strong temperature and time (sunrise and sunset time) dependence in their emissions. *Banana* and *Pine* emissions were low whilst *Mango* emitted