Antileukemic ancistrobenomine B and related 5,1'-coupled naphthylisoquinoline alkaloids from the Chinese liana Ancistrocladus tectorius

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A striking feature of the metabolite pattern of the Southeast Asian liana Ancistrocladus tectorius (Ancistrocladaceae) is the predominance of 5,1'-coupled naphthylisoquinoline alkaloids. About 20 alkaloids of this coupling type have so far been discovered in this plant species. Here, we report on the isolation of four new 5,1'-linked naphthylisoquinolines from the twigs and stems of A. tectorius. Two of them, the ancistrobenomines B (5) and C (6), belong to the very rare group of alkaloids with a fully dehydrogenated isoquinoline portion. Likewise unusual for naphthylisoquinoline alkaloids is the presence of a hydroxymethylene group at C-3. Within the large class of meanwhile ca. 180 such natural products, this structural peculiarity had so far been known only from two other representatives isolated from the Malaysian species A. benomensis, and from one single naphthalene-devoid 3-hydroxymethyleneisoquinoline from A. tectorius. Seven further 5,1'-linked alkaloids, previously isolated from related Asian and African Ancistrocladus species, have now been identified for the first time in A. tectorius. Their structural elucidation was achieved by spectroscopic analysis including HRESIMS, 1D and 2D NMR, and by chemical (oxidative degradation) and chiroptical (electronic circular dichroism) methods. Ancistrobenomine B (5) exhibited moderate effects against Plasmodium falciparum and Trypanosoma brucei rhodesiense in vitro, and it was found to display strong cytotoxic activities against drug-sensitive acute lymphoblastic CCRF-CEM leukemia cells and their multidrug-resistant subline, CEM/ADR5000.
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