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Triterpenes of *Croton betulaster* (Euphorbiaceae)

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1. Subject and source

Croton betulaster Müll. Arg. is a shrub that is found in the northern part of the Cadeia do Espinhaço from Grão Mogol to the Serra do Sincorá in the Chapada, Diamantina, Bahia, Brazil (Cordeiro, 1995). Aerial parts of *Croton betulaster* were collected in Palmeiras, Chapada Diamantina, Bahia, Brazil, in June 1997 and identified by Maria Lenise S. Guedes from the Instituto de Biologia, UFBA. A voucher specimen has been deposited in herbarium of the Federal University of Bahia (ALCB number 031762), Brazil.

2. Previous works

No previous work has been recorded about *Croton betulaster*

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3. Present study

The air-dried leaves (600.0 g) were extracted with hexane, then with dichloromethane and finally with methanol. Evaporation of the solvents gave 100 g of hexane extract. Successive fractionations of the hexane extract (45.0 g) on a silica gel column eluted initially with hexane followed by stepwise increments of EtOAc gave the triterpenes lupenone (**1**, 233 mg), lupeol (**2**, 9.300 g), 3-oxo-22-hydroxyhopane (**3**, 0.031 g), 3-oxo-20- β -hydroxytaraxastane (**4**, 0.015 g), 3-oxo-20-hydroxylupane (**5**, 0.010 g), 3-oxo-olean-12-en-28-oic acid (**6**, 0.026 g), 3-oxo-olean-18-en-28-oic acid (**7**, 0.028 g), 3-oxo-cycloart-24E-en-26-oic acid (**8**, 0.012 g) and one flavonoid 5-hydroxy-7,4'-dimethoxyflavone (**9**, 0.079 g). The investigation of the hexane extract of the stems using the same methodology gave also the substances **2**, **6**, **7** and **9**. The substances were identified by ^1H NMR and ^{13}C NMR and comparison with data available in the literature for **1–2** (Mahato and Kundu (1994), **3** (Wilkins et al., 1987), **4** and **8** (Anjaneyulu et al., 1999), **5** (Dantanarayana et al., 1982), **6** (Shirane et al., 1996), **7** (Ahsan et al., 1995), **9** (Agrawal et al., 1989). The relative configuration of C-20 in **4** was determined with support of the NOESY and NOE diff experiments. The triterpenes are the principal constituents of the hexane extract of *Croton betulaster*, with lupeol the most abundant (20% w/w).

4. Chemotaxonomic significance

The genus *Croton* comprises about 700 species of which approximately 300 are found in Brazil (Schultz, 1984). A preliminary examination in the chemical abstracts showed that *Croton* species produce mainly diterpenes, however chemical investigation of *Croton betulaster* has led to identification of triterpenes. This is the first report of a hopane triterpene in *Croton* species and the third in the Euphorbiaceae family. Hopane triterpenes are found mostly in more primitive plants, such as ferns, and infrequently in higher plants. Diterpenes were not detected in the hexane extract of *Croton betulaster*.

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