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CHEMICAL CONSTITUENTS OF ESSENTIAL OILS FROM *Solanum torvum* LEAVES, STEMS, FRUITS, AND ROOTS

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Solanum torvum L. (Solanaceae) is a small shrub, commonly known as "Turkey berry," distributed widely in India, Malaya, China, Philippines, and tropical America [1]. "Turkey berry" extracts have showed diverse pharmacological activities such as antihypertensive, antioxidant, cardiovascular, antiplatelet aggregation, antimicrobial and antiviral activity [2, 3]. The plant activities have been associated with the presence of alkaloids, flavonoids, saponins, tannins, and glycosides in its tissues [3]. Although it has frequently been investigated for its pharmacological and chemical properties, there are no studies examining the content and chemical composition of the essential oil from *S. torvum* tissues, except for leaf tissues [4].

In this study, we report the chemical composition of essential oils from *S. torvum* leaves, stems, fruits, and roots obtained by hydrodistillation, yielding about 0.11, 0.04, 0.07, and 0.02% (w/w) essential oils, respectively.

Fresh plant tissues were collected in Recife, Pernambuco, Brazil (S08°21′06.0″; WO34°57′07.8″) and identified by Dr. M. F. Agra, Head of the Botany Section of LTF-UFPB-Brazil. A voucher specimen was deposited at the Vasconcelos Sobrinho Herbarium, UFRPE.

The essential oils were analyzed by GC-MS (60–240°C at 3°C min rate) in a Varian 431-GC coupled to a Varian 220-MS instrument using a fused-silica capillary column (30 m × 0.25 mm i.d. × 0.25 μm) coated with DB-5. The injector and detector temperatures were 250 and 260°C, respectively. Hydrogen was used as carrier gas at a flow rate of 1.5 mL/min; injection was in the split mode (1:100), and the injection volume was 1.5 μL of a solution containing ca. 10 mg/mL of oil in dichloromethane. MS spectra were obtained using electron impact at 70 eV with a scan interval of 0.5 s and mass range from 40 to 550 *m/z*.

TABLE 1. Composition of the Essential Oils from the Leaves, Stems, Fruits, and Roots of *S. torvum*, %

Compound	RRI	Leaves	Stems	Fruits	Roots
Santalone	1178			16.1	
Methyl salicylate	1194			19.5	
Nerol	1229			3.3	12.0
trans-Muulora-3,5-diene	1452		3.2		
Z-Nerolidol	1530	2.5			
cis-Sesquisabinene hydrate	1542			3.0	
β-Vetivenene	1556		55.4		
Guaiol	1601		1.5		
Z-Asarone	1616	30.1			
1,10-di-*epi*-Cubenol	1619		25.6		
Dillapiole	1621	7.9		55.3	48.0
10-*epi*-*γ*-Eudesmol	1623		4.2		
4,6-Dimethoxy-5-vinyl-1,2-benzodioxyde	1647	11.5			
E-Asarone	1676	36.4			1.0
Cyclocolorenone	1761				12.6
Cryptomeridiol	1814				9.0
Total		88.4	89.9	97.3	82.6

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Quantitative analysis of the chemical constituents was performed using a flame ionization detector (FID) using a Perkin–Elmer instrument under the same conditions and with the same column as reported for the GC-MS. The initial identification of components of the essential oil was carried out by comparison with previously reported values of retention indices, obtained by co-injection of oil samples and C_{11}–C_{24} linear hydrocarbons and calculated according to the equation of Van den Dool and Kratz (1963) [5]. Subsequently, the MS acquired for each component was matched with those stored in the Wiley/NBS mass spectral library of the GC-MS system and with other published mass spectral data [6].

The chemical profiles of the oils by GC-MS indicated the predominance of phenylpropanoids, except in the stem tissues where the sesquiterpene β-vetivenene (55.4%) was the main constituent (Table 1). In the essential oils of the tissues of roots and fruits, the phenylpropanoid dillapiole appeared to be the major constituent, with 48.0 and 55.3%, respectively. In the essential oil of the leaf tissues, the phenylpropanoids *Z*-asarone (30.1%) and *E*-asarone (36.4%) were identified as the major constituents. This is the first report of phenylpropanoids in the essential oil of the leaf tissues of *S. torvum*.

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