CHEMICAL COMPOSITION OF THE ESSENTIAL OIL FROM STEMS OF *Calycanthus floridus* L. VAR. oblongifolius FROM IRAN

Hashem Akhlaghi

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The genus *Calycanthus,* belonging to the Calycanthaceae family endemic to North America, includes two to four species, depending on taxonomic interpretation. Of these, two are accepted by *Flora of North America* [1].

Calycanthus floridus L. var. oblongifolius (Nutt.) D.E. Boufford & S.A. Spongberg has various synonyms: *Calycanthus fertilis* Walt., *Calycanhus nanus* Loisel , *Calycanthus floridus* L. var. laevigatus (Willd.) T. & G., *Calycanthus glaucus* (Willd.), and the common name, Eastern Sweetshrub.

The fruits are reported to be poisonous to sheep [3]. *Calycanthus* contains calycanthine, an alkaloid similar to strychnine, which is toxic to humans and livestock [4]. The leaves, root, and bark of *Calycanthus floridus* L. var. oblongifolius have been dried and used as a substitute for cinnamon [5], although some caution is advised [4]. Infusions of the bark have been used to treat urinary problems [6].

In Iran, two species of the genus *Calycanthus* have been planted as ornamental shrubs, namely *Calycanthus floridus* and *Calycanthus fertilis* [7]. Because of their similarity in color to red wine, both of them are called "wine flower" in Persian.

In this work the hydrodistilled essential oil from the crushed, dry stems of *Calycanthus floridus* L. var. oblongifolius (syn. *Calycanthus fertilis*) (Calycanthaceae) collected in Sabzevar, Khorasan Province, Iran, were studied by GC and GC/MS. The air dried stems of this shrub yielded 0.15% (w/w) of a colorless oil, whose percentage compositions are given in Table 1.

Twenty compounds, accounting for 93.9% of the stem oil, were identified: seven monoterpene hydrocarbons (26.3%), eight oxygenated monoterpenes (56.0%), two sesquiterpene hydrocarbons (0.8%), and three oxygenated sesquiterpenes (10.8%). The main components were 1,8-cineol (31.7%), bornyl acetate (12.6%), α-pinene (10.0%), elemol (9.0%), β-pinene (7.2%), and α-terpinyl acetate (6.8%). As can be seen from the above information, in the stem oil of *Calycanthus fertilis* monoterpenes predominated over sesquiterpenes, and among the former, oxygenated monoterpenes were the major constituents, accounting for 56.0% of the total. No nonterpene hydrocarbons were found among the identified compounds. To the best of my knowledge, this is the first report of essential oil composition from the genus *Calycanthus*.

TABLE 1. Composition of Stem Essential Oil of *Calycanthus floridus* L. var. *oblongifolius*

Compound	KI[a]	%	Compound	KI[a]	%
α-Pinene	939	10.0	Geraniol	1255	0.3
Camphene	953	3.8	Bornyl acetate	1289	12.6
β-Pinene	980	7.2	α-Terpinyl acetate	1350	6.8
Myrcene	991	2.2	Neryl acetate	1365	0.1
α-Phellandrene	1005	2.6	Germacrene D	1480	0.2
1,8-Cineol	1033	31.7	Bicyclogermacrene	1494	0.6
γ-Terpinene	1062	0.1	Elemol	1549	9.0
Terpinolene	1088	0.4	10-*epi*-γ-Eudesmol	1619	0.7
Linalool	1098	1.0	γ-Eudesmol	1630	1.0
Terpinen-4-ol	1177	0.8	Total		93.9
α-Terpineol	1189	2.8			

[a]The compounds are arranged according to their Kovatz retention indices (KI) on an HP-5MS capillary column.

Department of Basic Science, Islamic Azad University, Sabzevar branch, Sabzevar, Iran, e-mail: sh_akhlaghi2001@yahoo.com. Published in Khimiya Prirodnykh Soedinenii, No. 5, p. 534, September-October, 2008. Original article submitted March 19, 2007.

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