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ADDITIONAL ALKALOIDS OF *TRICLISIA PATENS* AND *TRICLISIA SUBCORDATA**

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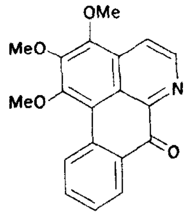
Key Word Index—*Triclisia patens*; *Triclisia subcordata*; Menispermaceae; alkaloids; *O*-methylmoschatoline (homomoschatoline); aromoline; tetrandrine.

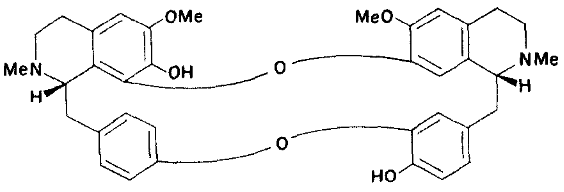
Plant. Triclisia patens Oliv. (Menispermaceae) and *Triclisia subcordata* Oliv. (Menispermaceae) are woody climbers of the forests and coastal areas of Ghana [1]. The plants were collected and identified by Mr. K. Obeng-Darko F.L.S. of the Faculty of Agriculture, University of Science and Technology, Kumasi. Voucher specimens are on deposit at the Faculty of Pharmacy of the University. *Uses.* Medicinal [1]. *Previous work.* On *T. patens* [2–5] and *T. subcordata* [5,6].

Plant part examined. The powdered leaves (700 g) of *T. patens* were moistened with dil NH_4OH and extracted by repeatedly refluxing with EtOH. Combined EtOH extracts were filtered, concentrated under red pres and treated with dil HOAc (6%). The acidic mixture was filtered, the filtrate basified with NH_4OH and extracted with $CHCl_3$. The $CHCl_3$ extract was dried (Na_2SO_4), filtered and concentrated under red pres to afford a residue (6·5 g). Chromatography of this residue over Al_2O_3 in Et_2O afforded **1** and **2**.

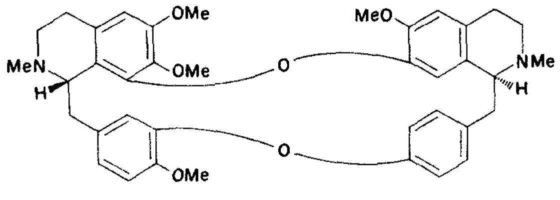
O-methylmoschatoline (**1**) (*homomoschatoline*). Dark red needles; 40 mg; mp 177° (Et_2O); $[\alpha]_D^{22}$ 0° ($CHCl_3$; *c* 0·5); λ_{max}^{EtOH} nm (log ϵ): 221 (4·46), 235 (4·46), 275 (4·56), 311 (*sh*) (3·90), 365 (*sh*) (3·42) and 440 (3·22); ν_{max}^{KBr} cm^{-1}: 1660, 1580, 1480, 1467, 1391, 1312, 1205, 1094, 1004, 972, 937 and 757; $\delta_{60\,MHz}^{CDCl_3}$: 4·03 (*s*, 3H, OMe), 4·06 *s*, 3H, OMe), 4·14 (*s*, 3H, OMe) and 7·5–9·0 (*m*, 6H, ArH); MS M^+ *m/e* 321 (100%) for $C_{19}H_{15}NO_4$, 306 (38), 291 (6), 278 (8), 263 (9), 248 (5), 235 (4), 220 (8), 207 (1), 192 (3) and 164 (4) identical by



(**1**) *O*-Methylmoschatoline



(**2**) Aromoline



(**3**) Tetrandrine

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* Part 11 in the series "Constituents of West African Medicinal Plants". For Part 10 see Dwuma-Badu, D., Ayim, J. S. K., Mingle, C. A., Tackie, A. N., Slatkin, J. E. and Schiff, P. L., Jr. (1975) *Phytochemistry* **14**.

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direct comparison (UV, IR, NMR, MS, mp, mmp) with an authentic sample. *O*-methylmoschatoline has been previously isolated from the stems of *T. gillettii* [7] and *Guatteria subsessilis* [8].

Further elution of the column with $CHCl_3$ afforded: *aromoline* (**2**) white needles; 180 mg; mp 198–202° ($CHCl_3$); $[\alpha]_D^{22}$ + 249·5° (pyr; *c* 1·0); λ_{max}^{MeOH} nm (log ε): 208 (4·94), 228 (*sh*) (4·69) and 285 (3·95); ν_{max}^{KBr} cm^{-1}: 3535, 2930, 1660, 1580, 1480, 1467, 1391, 1312, 1205, 1094, 1004, 972, 937 and 757; $\delta_{60\,MHz}^{CDCl_3}$: 2·53 (*s*, 3H, NMe), 2·56 (*s*, 3H, NMe), 3·56 (*s*, 3H, OMe), 3·78 (*s*, 3H, OMe) and 6·32–7·45 (*m*, 10H, ArH); MS M^+ *m/e* 594 (100%) for $C_{36}H_{38}N_2O_6$, 593 (53), 382 (46), 381 (85), 368 (8), 367 (40), 364 (8), 297 (3), 192 (17), 191·5 (18), 191 (75), 174 (17) and 168 (14) identical by direct comparison (UV, IR, NMR, MS, mp, mmp) with an authentic sample. Although aromoline has been previously isolated from *Daphnandra aromatica* [9], *Daphnandra tenuipes* [9] and *Thalictrum thunbergii* [10], this is the first reported isolation of this alkaloid from the genus *Triclisia*.

The powdered roots (1 kg) of *T. subcordata* were percolated with HOAc (6%). The acidic extract (24 l) was basified with NH_4OH and extracted with $CHCl_3$ (56 l) in a batchwise fashion. Combined $CHCl_3$ extracts were dried over anhydrous Na_2SO_4, filtered and the filtrate evaporated *in vacuo* to afford an alkaloidal residue (24 g). Adsorption of this residue on Al_2O_3 (30 g) followed by chromatography over Al_2O_3 (180 g) in Et_2O then EtOAc afforded an oily base which upon rechromatography over Al_2O_3 in Et_2O yielded: *tetrandrine* (**3**) white needles; 160 mg; mp 218° (Et_2O); $[\alpha]_D^{21}$ + 241·38° ($CHCl_3$; *c* 0·87); λ_{max}^{MeOH} nm (log ε): 214 (4·78) and 283 (3·91); ν_{max}^{KBr} cm^{-1}: 1608, 1585, 1505, 1273, 1235, 1213, 1135, 1128, 1113, 1070, 1028 and 845; $\delta_{60\,MHz}^{CDCl_3}$: 2·29 (*s*, 3H, NMe), 2·58 (*s*, 3H, NMe), 3·15 (*s*, 3H, OMe), 3·31 (*s*, 3H, OMe), 3·69 (*s*, 3H, OMe), 3·87 (*s*, 3H, OMe) and 5·91–7·35 (*m*, 10H, ArH); MS M^+ *m/e* 622 (33%) for $C_{38}H_{42}N_2O_6$, 621 (19), 607 (6), 396 (12), 395 (42), 349 (7), 335 (5), 198·5 (23), 198 (100), 192 (10), 190 (7), 176 (8), 175·5 (9), 175 (39) and 174 (31) identical by direct comparison (UV, IR, NMR, MS, mp, mmp) with an authentic sample.

Tetrandrine has been previously isolated from numerous Menispermaceous species including *Cyclea burmanni* [11], *Cyclea peltata* [11], *Menispermum canadense* [11] and *Stephania tetrandra* [11]. This, however, is the first reported isolation of this alkaloid from *Triclisia* species.

Biological significance. Extracts of these and other *Triclisia* species have been used in the treatment of malaria, diarrhea, pyorrhea, swelling in the extremities, anaemia and joint pains and as arrow poisons [1].

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