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ALKALOIDS OF *CISSAMPELOS PAREIRA**

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Plant. Cissampelos pareira L. (Menispermaceae), a woody climber of the forests of Ghana. The plant was collected and identified by Mr. K. Obeng-Darko, 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 the roots [2–14], whole plant [15,16] and the leaves [17] for the alkaloids hayatine [(±)-bebeerine] [(±)-curine] [2–6,8–11,17], hayatinine [(−)-4″-*O*-methylbebeerine] [(−)-4″-*O*-methylcurine [2,5,7–9,12,17], (−)-bebeerine [4–6,8–10,17], (+)-isochododendrine [6,8–10], cyclanoline chloride (cissamine chloride [9,14], cissampareine [15,16], (+)-4″-*O*-methylcurine [(+)-4″-*O*-methylbebeerine] [18], hayatidine [(±)-4″-*O*-methylbebeerine] [(±)-4″-*O*-methylcurine] [13,17], cycleanine [17] and for (+)-quercitol [2–5,17], sterols [2,4,5] and essential oil [4,5].

Plant part examined. The powdered roots (2.25 kg) were percolated with dil HOAc (10%). The acidic extract (39 l.) was basified with NH_4OH and extracted with $CHCl_3$ (49 l.) in a batchwise fashion. The combined $CHCl_3$ extracts were dried (Na_2SO_4), filtered and the filtrate evaporated *in vacuo* to afford an alkaloidal residue (39 g). Adsorption of this residue on Al_2O_3 (36 g) followed by chromatography over Al_2O_3 (88 g) in Et_2O and then Et_2O–MeOH afforded the following alkaloids (in order of elution):

Dehydrodicentrine. 26 mg; mp 216° (Et_2O); $[\alpha]_D^{21}$ 0° ($CHCl_3$; *c* 0·35); λ_{max}^{MeOH} nm (log ε): 217 (4.40), 266 (4.87), 303 (4.02) and 339 (4.23); ν_{max}^{KBr} cm^{-1}: 1595, 1515, 1470, 1397, 1308, 1209, 1114 and 857; $\delta_{60\,MHz}^{CDCl_3}$: 3·08 (*s*, 3H, NMe), 3·99 (*s*, 6H, OMe), 6·12 (*s*, 2H, CH_2O_2), 6·47 (*s*, 1H, ArH), 6·82 (*s*, 1H, ArH), 6·99 (*s*, 1H, ArH) and 8·34 (*s*, 1H, ArH); MS M^+ *m/e* 337 (100%) for $C_{20}H_{19}NO_4$, 322 (88), 293 (8), 279 (7), 251 (4) and 168·5 (18) identical by direct comparison (UV, IR, NMR, mp, mmp) with an authentic sample.

Dicentrine. 412 mg; mp 167–168·5° (Et_2O); $[\alpha]_D^{21}$ +57·77° ($CHCl_3$; *c* 1·35); λ_{max}^{MeOH} nm (log ε): 220 (4·21), 281 (3·88), 305 (3·92) and 315 (*sh*) (3·88); ν_{max}^{KBr} cm^{-1}: 1603, 1520, 1461, 1455, 1390, 1341,

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1267, 1245, 1214, 1097, 928, 865, 770 and 608; $\delta^{CDCl_3}_{60\,MHz}$: 2·53 (*s*, 3H, NMe), 3·90 (*s*, 6H, OMe), 6·84 (*d*) and 6·98 (*d*) (*J*gem 2Hz) (2H, CH_2O_2), 6·42 (*s*, 1H, ArH), 6·69 (*s*, 1H, ArH), and 7·56 (*s*, 1H, ArH); MS M^+ *m/e* 339 (69%) for $C_{20}H_{21}NO_4$, 338 (100), 337 (7), 324 (7), 322 (7), 309 (9), 296 (17), 265 (12) and 238 (4) identical by direct comparison (UV, IR, NMR, MS, mp, mmp) with an authentic sample.

Cycleanine. 75 mg; mp 280° (Et_2O); $[\alpha]_D^{22}$ − 15·94° ($CHCl_3$; *c* 0·69); λ_{max}^{MeOH} nm (log ε): 232 (*sh*) (4.87), 276 (3.89) and 285 (*sh*) (3·83); ν_{max}^{KBr} cm^{-1}: 1608, 1505, 1490, 1452, 1415, 1375, 1340, 1293, 1220, 1170, 1145, 1115, 1068, 1017, 843 and 805; $\delta^{CDCl_3}_{60\,MHz}$: 2·53 (*s*, 6H, NMe), 3·38 (*s*, 6H, OMe), 3·78 (*s*, 6H, OMe), 6·13–7·05 (*m*, 10H, ArH); MS M^+ *m/e* 622 (29%) for $C_{38}H_{42}N_2O_6$, 621 (8), 313 (26), 312 (100), 311 (28), 204 (29), 190 (17), 174 (17), 159 (14), 146 (7) and 145 (8) identical by direct comparison (UV, IR, NMR, MS, mp, mmp) with an authentic sample.

Insularine. 45 mg; mp 157° (Et_2O); $[\alpha]_D^{22}$ + 11·36° (EtOH; *c* 0·44); λ_{max}^{EtOH} nm (log ε): 209 (4·68), 229 (*sh*) (4·56) and 276 (3·64); ν_{max}^{KBr} cm^{-1}: 1605, 1580, 1500, 1450, 1420, 1365, 1260, 1215, 1114, 1070, 1010, 834 and 810; MS M^+ *m/e* 620 (90%) for $C_{38}H_{40}N_2O_6$, 619 (38), 605 (6), 313 (20), 312 (100), 311 (28), 310 (74), 309 (26), 204 (14), 190 (12), 174 (9), 159 (8), 146 (8) and 145 (9) identical by direct comparison (UV, IR, MS, mp) with an authentic sample.

Isochondodendrine. 78 mg; mp 295° (Et_2O–MeOH); $[\alpha]_D^{22}$ +40·32° (pyr; *c* 0·62); λ_{max}^{EtOH} nm (log ε): 211 (4·72), 231 (*sh*) (4·58), 278 (3·73) and 285 (3·72); ν_{max}^{KBr} cm^{-1}: 1610, 1585, 1508, 1450, 1295, 1215, 1170, 1115, 1065, 1042, 1015, 975, 940, 928, 855, 845, 815, 805 and 759; MS M^+ *m/e* 594 (60%) for $C_{36}H_{38}N_2O_6$, 593 (14), 487 (4), 312 (4), 299 (14), 298 (100), 297 (20), 191 (9), 190 (7) and 162 (6) identical by direct comparison (UV, IR, MS, mp, mmp) with an authentic sample.

Although isochondodendrine has been isolated several times from *C. pareira* [6,8–10], cycleanine has only recently been isolated from *C. pareira* [17] and from *C. insularis* [20]. Furthermore, this is the first reported isolation of dehydrodicentrine and dicentrine in the genus *Cissampelos* and the first reported isolation of insularine in *C. pareira*, the latter base first isolated from *C. insularis* [21].

Biological significance. Alkaloids of the plant have pronounced pharmacological effects [10,22].

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