

New Alkaloids from *Aristotelia chilensis* (Mol.) Stuntz

By MAGALIS BITTNER and MARIO SILVA*

(Natural Products Laboratory, Department of Biology, University of Concepcion, Chile)

E. M. GOPALAKRISHNA, WILLIAM H. WATSON, and V. ZABEL,

(Fastbios Laboratory, Department of Chemistry, Texas Christian University, Fort Worth, Texas 76129)

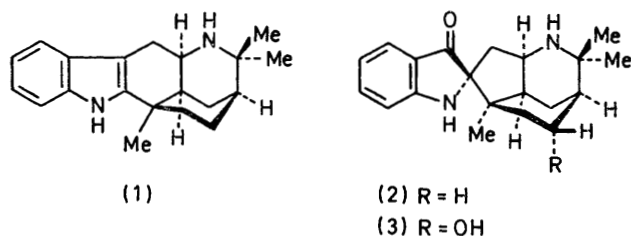
and STEPHEN A. MATLIN and PETER G. SAMMES

(Department of Chemistry, The City University, St. John Street, London EC1V 4PB)

Summary The structures of two new alkaloids, aristotelinine (**4**) and aristone (**5**), from *Aristotelia chilensis*, are reported.

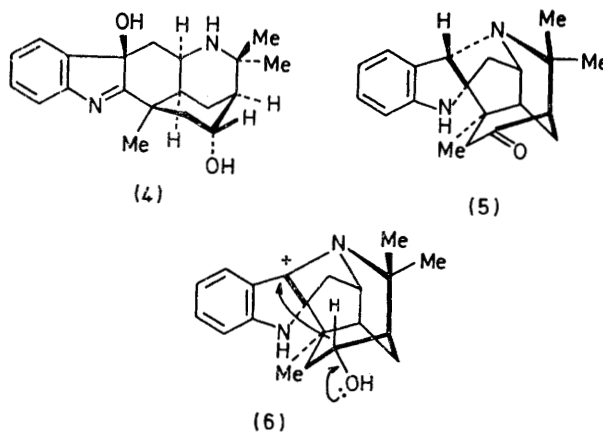
SPECIES of *Aristotelia* contain a unique series of indole alkaloids which are known to incorporate a non-loganin derived monoterpene unit. Reported structures include aristoteline (**1**) and aristotelone (**2**) isolated from the title

plant.¹ Aristoteline has also been isolated from *A. serrata*,² whilst peduncularine, another type of novel indole alkaloid, has been reported from *A. peduncularis*.³



We now report the structure of two further alkaloids of this class, both isolated from *A. chilensis*. The first, which was more polar than aristoteline (1) and which was named aristotelinine, was isolated in very low yield (5 mg from 10 kg plant material). This alkaloid had m.p. 246–250 °C. Its u.v. absorption [λ_{max} (MeOH) 220, 263 nm; ϵ 18,000, 6000] was characteristic of an indolenine type, whilst its i.r. spectrum indicated the presence of hydroxy-groups. From its mass spectrum a molecular formula of $\text{C}_{20}\text{H}_{26}\text{N}_2\text{O}_2$ was obtained. The complete structure was solved by an X-ray crystallographic analysis which gave the structure indicated by (4). The second compound, aristone, which was less polar than aristoteline (1), proved to be a ketone, ν_{max} 1695 cm^{-1} . This material was also isolated only in small amounts (4 mg from 10 kg). Mass spectral analysis revealed the formula $\text{C}_{20}\text{H}_{24}\text{N}_2\text{O}$. Its u.v. spectrum was characteristic of a substituted aniline [λ_{max} (MeOH) 290 nm; ϵ 5000]. Again the structure was solved by X-ray analysis of the crystalline material, m.p. 240–242 °C. Aristone proved to have the novel hexacyclic indoline

structure (5). This unusual structure possibly arises *via* rearrangement of (4) to the ψ -indoxyl species (3), which is related to aristotelone (2). Models show that interaction of the aliphatic amine with the benzoyl function is possible, thus generating the carbonium species (6). Subsequent intramolecular hydrogen migration generates (5). The transferred hydrogen and the newly formed ketone group remain in close proximity in the product indoline.



We thank Professor C. Marticorena for the botanical identification and Mr. J. Vargas for technical assistance. This work was supported by the Organisation of American States and CONICIT, Chile, and the X-ray analyses were supported by a grant from the National Science Foundation.

(Received, 13th October 1977; Com. 1069.)

¹ D. S. Bhakuni, M. Silva, S. A. Matlin, and P. G. Sammes, *Phytochemistry*, 1976, **15**, 574.

² B. F. Anderson, G. Robertson, H. P. Avey, W. F. Donovan, I. R. C. Bick, J. B. Bremner, A. J. J. Finney, N. W. Preston, R. T. Gallagher, and G. R. Russell, *J.C.S. Chem. Comm.*, 1975, 511.

³ I. R. C. Bick, J. B. Bremner, N. W. Preston, and I. C. Calder, *Chem. Comm.*, 1971, 1155; see also I. R. C. Bick and R. T. Gallagher, Abstract E8, I.U.P.A.C. meeting, Otago, New Zealand, 1976.